The New England
Journal of Medicine

VOLUME 205 SEPTEMBER 10, 1931 NUMBER 11

The Massachusetts Medical Society

SECTION OF TUBERCULOSIS

Georgian Room, Hotel Statler, Boston, June 9, 1931, 3:00 P. M.

DR. SUMNER H. REMICK, PRESIDING

THE Section of Tuberculosis will come to order. This section is an hour late, and although I am not responsible for the delay I apologize for keeping you waiting.

(Announcements.)

Without further preliminary remarks, I will call on the first speaker of the afternoon, Dr. John B. Hawes, 2nd, of Boston, who will deliver "A Historical Sketch of the Section of Tuberculosis of the Massachusetts Medical Society."

A HISTORICAL SKETCH OF THE TUBERCULOSIS SECTION OF THE MASSACHUSETTS MEDICAL SOCIETY

BY JOHN B. HAWES, 2ND, M.D.*

IN giving a history of the Tuberculosis Section of the Massachusetts Medical Society I must needs be distinctly personal. One of the biggest things, if not the biggest thing, in my medical life has been my close and intimate acquaintanceship with two men, covering a period of many years. Both of these men are now gone, —Dr. Frederick C. Shattuck and Dr. Arthur T. Cabot of Boston. It is concerning Dr. Cabot that I would speak, for the history of this section might well take the form of a memorial to a great and good man who, in the declining years of his life when he had well earned his repose and when already suffering from the disease which eventually killed him, took upon his shoulders the thankless and laborious task of putting Massachusetts and the Massachusetts Medical Society on the map, as it were, in terms of tuberculosis.

Early in my medical career, in fact immediately after graduation from my interneship at the Massachusetts General Hospital in 1904, I became interested in tuberculosis and its problems and, thanks to Dr. Joseph H. Pratt, for a good many years helped him to demonstrate what home treatment of this disease could do, and later, formed a tuberculosis class of my own.

It was in the year 1906 when, at the request of Dr. Cabot, the "Associated Committees of the Massachusetts Medical Society for the Prevention and Control of Tuberculosis" were formed. Dr. Cabot felt—and quite properly—that this disease was not receiving the attention at the hands of the Massachusetts Medical Society that it should and believed that some vigorous action was needed to remedy this state of affairs. He was the first Chairman of these Associated Committees and from his wide acquaintanceship with physicians throughout the state appointed subcommittees, each composed of eight to ten men prominent in their localities, throughout the various medical districts. Dr. Thomas F. Harrington, now deceased, was the first secretary and the first meeting of these committees was held on June 12, 1906, and the first report issued in October of the same year. Here in this report one finds in brief—and I must admit in extraordinarily brief—form a description of the tuberculosis activities in each of the medical districts. In this report the last four lines (in which I recognize the hand of Dr. Cabot) are significant: "For the present let us unite on four objects, namely, registration, disinfection, anti-tuberculosis associations and hospitals for advanced cases." With this report and the work of the Associated Committees for that year I had nothing to do.

The year 1907 was a memorable one to me as my whole subsequent career dated from then. At that time Dr. Cabot, who evidently had had an eye on me and on what I was doing at the Massachusetts General Hospital in tuberculosis work, asked me to be the corresponding secretary of these Associated Committees as Dr. Harrington had become very busy and his work had carried him in other directions. It was in this same year that Dr. Cabot was appointed by Governor Draper Chairman of the State Tuberculo-

*Hawes — President, Boston Tuberculosis Association. For record and address of author see "This Week's Issue", page 549.

sis Commission and had asked me to act as the secretary of this body. Being thus associated for a certain number of hours each day made it very convenient for us to work together on the tuberculosis problems of the state and of these Associated Committees. I remember most delightfully the annual luncheon Dr. Cabot used to give at the Union Club for the Chairmen of these committees. It was remarkable how these busy practitioners came from all over the state to attend this luncheon. They felt, as I did, that it was a very real and distinct privilege to be associated with so great and yet so modest a man. The annual meeting of these committees was held regularly at the time of the meeting of the Massachusetts Medical Society and even then, although not officially so recognized, constituted its Tuberculosis Section. The first meeting of these committees was held with that of the Massachusetts Medical Society in 1907 with the following program: "Factory Inspection" by Dr. F. G. Wheatley of North Abington; "Health Inspectors: Their Function" by Dr. Charles Harrington of Jamaica Plain, then Secretary of the State Department of Health; "The Class Method for the Home Treatment of Consumption" by Dr. J. H. Pratt of Boston; "The Channels of Infection in Tuberculosis" by Dr. Theobald Smith of Boston. Dr. Cabot was Chairman of these committees and presided at their meetings until his death in 1913 when he was succeeded by Dr. J. F. A. Adams of Pittsfield. I was the corresponding secretary and, as a matter of fact, was the only secretary there was from 1907 until 1919 when I was succeeded by Dr. E. O. Otis of Boston.

In 1912 the Massachusetts Medical Society, finally realizing that the meetings of these associated committees held year after year constituted a definite section, recognized this fact in the formation of the Tuberculosis Section of the Massachusetts Medical Society. Its work did not in any way change except that the men who had formerly been members of the Associated Committees in the various districts no longer officially acted in that capacity as these committees were then disbanded. The various Chairmen and the Secretaries of this Section, beginning with Dr. Arthur T. Cabot in 1912, were as follows:

1913	J. F. A. Adams	J. B. Hawes, 2nd
1914	Lyman Asa Jones	"
1915	A. C. Getchell	"
1916	"	"
1917	W. G. Phippen	"
1918	"	"
1919	H. D. Chadwick	E. O. Otis
1920	"	"
1921	no section	
1922	E. O. Otis	S. H. Remick
1923	"	"
1924	Henry Colt	P. J. Sullivan
1925	"	"
1926	A. S. MacKnight	Randall Clifford
1927	"	"
1928	J. B. Hawes, 2nd	W. A. Griffin
1929	"	"
1930	W. A. Griffin	S. H. Remick

Year after year the question has arisen as to whether the Tuberculosis Section is or is not performing a useful function. The same question has arisen in other tuberculosis organizations. The question has come up as to whether the National Tuberculosis Association, for instance, should change its name and its purpose to that of the National Health Association. I have brought up this matter as to a change of name various times before the Executive Committee of the Boston Tuberculosis Association. The State Association of Maine has changed its name from that of tuberculosis to the Maine Public Health Association with, on the whole I believe, poor results. New York has added the word "health" so that the organization's title reads, New York Tuberculosis and Health Association. But regardless of name or title the tuberculosis problem is still with us and I believe it will be many years before it will be wise to change the name of this Section or, as has been suggested, to merge it with the Medical Section.

I have enjoyed the meetings of this Section which I have attended fairly regularly since its beginning in 1907. There is a sense of intimacy and informality here which I do not find elsewhere. Years ago I was one of the younger members; today I am distinctly one of the older men so far as tuberculosis work is concerned in this city. As I look back over Dr. Cabot's Associated Committees which led to the formation of this Section, I recall certain men who were particularly prominent and active in these early days of tuberculosis work in Massachusetts: Dr. W. D. Kenney of Osterville; Drs. F. S. Coolidge, Henry Colt, and J. F. A. Adams of Pittsfield; Dr. W. O. Hewett of Attleboro; Dr. G. L. Richards of Fall River; Dr. I. J. Clarke of Haverhill, who is still a regular attendant at these Section meetings and one of the outstanding figures in tuberculosis work in Massachusetts; Dr. C. A. Allen of Holyoke; Dr. M. W. Pearson of Ware; Dr. J. H. Nichols of Tewksbury, who for so many years ably ran the State Infirmary; Dr. Alfred Worcester of Waltham and now of Harvard University; Dr. H. D. Chadwick, now of Detroit, whose name is so dear to us all; Dr. Eugene J. Darling of Cambridge; Drs. H. Lincoln Chase and David Townsend of Brookline; Dr. Bradford Kent of Dorchester; Dr. Arthur Mitchell of Medfield; Dr. J. H. Ash of Quincy; Dr. W. C. Keith of Brockton; Dr. Albert C. Getchell of Worcester, who is still active in tuberculosis affairs of that city; Dr. Walter P. Bowers of Clinton, whose name needs no introduction to us; Dr. F. H. Washburn of Jefferson; Dr. E. P. Miller of Fitchburg; Dr. G. B. Underwood of Gardner; and finally, in Boston, the Suffolk District, Dr. William H. Devine, who did such pioneer work in school hygiene, Dr. Arthur K. Stone, Dr. James J. Minot, and, foremost of all, Dr. E. O. Otis, than whom no man stands higher in our esteem and in our affection and toward whom we all owe a debt of gratitude for what he has done in tuberculosis work in Massachusetts.

This, gentlemen, is certainly a roll of honor. It has been to me a very real and great privilege to have been and to continue to be associated with such a group.

CHAIRMAN REMICK: We are indeed very grateful to Dr. Hawes for his able and interesting historical sketch of this section.

It is customary for the Chairman to appoint a nominating committee to present names for officers for the coming year. I will appoint the following: Dr. Walter Griffin, Chairman, Dr. Earl Willoughby and Dr. Donald King. If these gentlemen will meet some time during the Session and later present names for officers for the coming year, it will be appreciated.

Surgery is beginning to play a very important part in the treatment of certain types and stages of pulmonary tuberculosis. In looking over the program for the Surgical Section, I noticed several papers dealing with thoracic surgery. I am very glad that this important subject is being recognized by both Sections.

The next paper "The Selection of the Operation for the Patient in Pulmonary Tuberculosis," will be read by Dr. Edward D. Churchill, of Boston.

THE SELECTION OF THE OPERATION FOR THE PATIENT IN PULMONARY TUBERCULOSIS*

BY EDWARD D. CHURCHILL, M.D.†

DISCUSSIONS regarding the use of surgical measures in pulmonary tuberculosis have quite properly placed emphasis on the importance of the selection of the patient for operation. This fact, however, has created the impression that there is merely one form of operative treatment—paravertebral thoracoplasty. While this operation undoubtedly holds the position of major importance, so many other procedures and so many variations and special adaptations of thoracoplasty have been developed that discussion can no longer be limited to the selection of the patient for a single standardized procedure. Instead, we must concern ourselves with the indications for a number of efficacious procedures that may be employed singly, successively or in combination. The case of every patient with pulmonary tuberculosis is to be reviewed at frequent intervals with the question: "What type of operative interference may we suggest in this case at this time?" The selection of the proper patient for the operation thus gives way to the selection of the proper operation for the patient. I will briefly review the more common forms of operative interference illustrating by actual case histories the use of these procedures in individual cases.

PARAVERTEBRAL THORACOPLASTY

Paravertebral thoracoplasty is the most effective method of producing and maintaining collapse of a diseased lung, provided always that artificial pneumothorax is impossible. This operation is so familiar to you all that it is unnecessary to discuss the indications for its use or the brilliant results that may be attained in successful cases. Concerning the operation itself, I wish to call to your attention four cardinal points of a correctly performed thoracoplasty. Although these technical details may appear to be the affairs of the surgeon alone, the prolonged after-care of the patient is in the hands of the internist, and as in many other fields he must educate himself to be a critical judge of the surgeon's work. From time to time cases are seen in which the operation is said to have been a failure and not infrequently the fault lies not with the selection of the case, nor with the resistance of the patient but solely with the fact that the collapse obtained by the operation has been inadequate. When this is the case, a prompt recognition of the state of affairs is of the utmost importance as matters may still be rectified.

Returning to the technical aspects of thoracoplasty, first the operation is to be divided into stages. Here, American surgeons have departed from Continental methods and while the degree of collapse may not be so great as in the single stage procedure, because of partial regeneration of the ribs and the formation of scar tissue during the interval between the stages, the reduction in mortality rate is sufficient justification. There has been much discussion as to the proper sequence of the two stages of the operation—i.e., whether one shall resect the upper ribs first or the lower ribs. My own custom in this matter is to attack the chief focus of the disease first, whether it be in the apex or at the base. Then if any complication appears to delay the second stage, one can bide his time more happily with the chief focus of the disease obliterated.

As a second point, I wish to refer to the removal of long segments of ribs overlying cavities. This applies particularly to the subscapular area. In the original Sauerbruch operation which is done at one sitting, only small segments are removed from the ribs close to the vertebral column. Particularly when the operation is divided into stages, it is necessary

*Read before the Section of Tuberculosis, at the Annual Meeting of the Massachusetts Medical Society, June 9, 1931 at the Hotel Statler, Boston.

†Churchill—John Homans Professor of Surgery, Harvard Medical School. For record and address of author see "This Week's Issue", page 549.

to resect wide segments of ribs over large cavities or a fibrosed excavated apex.

Thirdly, a section must invariably be removed from the first rib. Fourthly, the ribs are to be cut on a line with the tips of the transverse processes of the vertebrae. The leaving of long rib stumps precludes satisfactory collapse.

ACCESSORY THORACOPLASTY

Reoperation

From time to time we meet with patients who for one reason or another have failed to attain the maximum degree of collapse that should follow the regular paravertebral thoracoplasty. This may be the fault of the operator, but not necessarily so, as it may occur, for example, because the interval between stages has been prolonged due to unavoidable complications. Usually marked improvement has been made as a result of the partial collapse but the patient continues to raise bacilli-laden sputum or to have recurring hemorrhages from an uncollapsed cavity. These patients may be helped further by removing the regenerated ribs and taking wider segments, particularly of the upper six. Although this procedure is technically difficult because of the irregular bone formation associated with rib regeneration, its constitutional effects on the patient seem to be far less than those of the primary operation. It is always unpleasant to propose a second operation to a patient, but I think it should be done without hesitation when the occasion presents itself.

Anterolateral Thoracoplasty

In cases with large apical cavities or with long-standing chronic fibroid contracture of the chest, it may be advisable to follow the regular posterior thoracoplasty by an anterolateral rib resection. This procedure gives further collapse and is well tolerated by the patient. I must emphasize, however, that an anterolateral thoracoplasty is not a substitute for a poorly done posterior thoracoplasty. If the collapse is not complete because the first rib has not been cut at the original operation or insufficient lengths of ribs have been removed, these faults will not be corrected by taking out the anterior segments of ribs. The only remedy that I see for an incompletely done posterior thoracoplasty is to face the situation courageously and reoperate through the old field.

APICAL COLLAPSE

Posterior and Anterolateral Thoracoplasty

Many attempts have been made to find a procedure to collapse the apex of the lung without collapsing the entire hemithorax. I believe that far more effective than any of the so-called apicolysis operations is an upper paravertebral thoracoplasty followed by an anterolateral removal of ribs. In resecting the upper ribs, particularly if the apex is the site of cavitation, long segments should be removed and the apex of the lung pushed downward after freeing it from the lower border of the first rib. It is even possible to expose the costochondral juncture of the first rib through the posterior approach. When this is done and wide segments of the ribs removed, the apex of the lung will be collapsed far more effectively than by any other type of apicolysis. This operation has a limited range of application and is only to be substituted for complete thoracoplasty on the basis of special indications—usually disease in the contralateral lung.

CASE I

H. N. (M. G. H. No. 313132)—Phrenicectomy. Upper Posterior Thoracoplasty. Anterolateral Thoracoplasty.

Age 40. Onset of pulmonary tuberculosis followed pneumonia in November, 1928. The patient was admitted to Rutland State Sanatorium on April 30, 1929. Advanced disease with cavitation at the right apex. Improvement took place under rest but the sputum remained positive and a large apical cavity remained open. On June 19, 1930 the right phrenic nerve was evulsed. This was followed by a decrease in cough and expectoration and a gain in weight of 5 lbs., although during the previous year the weight had been stationary. A constant aching pain that prevented her from sleeping on the right side was entirely relieved following the phrenic paralysis. Sputum reduced to 1 oz. in 24 hours. On April 18, 1931, the upper six ribs were resected through the posterior approach, especial care being taken to separate the apical pleura from the first and second ribs. On May 5, 1931, the anterior segments of the upper three ribs were resected through an axillary incision.

There was almost complete cessation of cough following the first operation and the sputum became minimal in amount. The patient was discharged for further sanatorium care.

CASE II

M. M. (B. C. H. No. 596951; B. M. No. 2286)—Phrenicectomy. Upper Posterior Thoracoplasty. Anterolateral Thoracoplasty. Secondary Posterior Thoracoplasty.

Age 36. Insidious onset of pulmonary tuberculosis during the winter of 1926. A positive diagnosis was made by x-ray in April, 1927, and one month later the patient entered Sassaquin Sanatorium. After some clinical improvement an exacerbation of symptoms occurred and in January, 1928, a pneumothorax was attempted without success. The patient was kept on strict bed rest, but x-ray films showed a steady increase in the size of the cavity until it filled the entire apex. She was very nervous and subject to frequent spells of indigestion with nausea and vomiting.

On November 18, 1929, a right phrenic evulsion was performed, followed on December 20, 1929 by a posterior resection of the upper 6 ribs. Her convalescence was slow and superficial sepsis in the wound postponed any consideration of further rib resection at that time. She returned to the Sanatorium in February and during the following year improved quite markedly. Her cough was less and the sputum amounted to approximately 1 oz. in 24 hours in contrast to 4 oz. before the operation. X-ray

films showed the cavity partially collapsed and with a fluid level.

On February 11, 1931, through an axillary approach, anterior segments were removed from the upper 4 ribs. The cavity now appeared to be held open by the posterior portions of the regenerated ribs so on March 21, 1931, a secondary posterior operation was performed. This produced a much greater collapse of the cavity and the patient returned to the Sanatorium with a further diminution in her cough and sputum.

Extrapleural Pneumolysis (Apicolysis)

The other forms of apicolysis have their place in the cases of patients too sick to withstand the more extensive rib resection that I have described. They may also be useful as preliminary operations, particularly when a cavity is located anteriorly. Probably the most effective form of extrapleural pneumolysis is the operation described by Alexander in which the pectoral muscle is transplanted in its entirety to a position within the thoracic cage. The apex of the lung is freed from the chest wall but the ribs are left in place without section. The muscle is then transplanted so that it comes to lie between this grating of ribs and the compressed lung. I have used this procedure three times and, although it appears satisfactory at the time, its results have not been brilliant, largely due, I believe, to the atrophy of the muscle. Cutting the origin and insertion of a muscle will be followed by atrophy even though the nerves and blood supply are left intact.

"Plombierung"

During the next few years we shall see a widespread introduction of the use of paraffin filling for the collapse of apical cavities. Certain clinics on the Continent are using this method with great enthusiasm. I have had no personal experience with this procedure and am inclined to doubt the advisability of its use in cases that can withstand even a limited thoracoplasty. In bilateral cases or very ill patients it may prove very helpful. In accepting this form of treatment it is well to recall that the history of surgery has repeatedly shown the introduction of a foreign body into living tissue to be physiologically an unsound principle.

PHRENIC NERVE INTERRUPTION

We are still in a period of uncertainty regarding the indications for phrenic nerve interruption. Judging from the number of times that this operation is being performed in some clinics, it must be done routinely as soon as the diagnosis of tuberculosis is established. Again we find internists and surgeons, particularly those who have encountered disappointing results, who consider that the operation is of no use. As in all other therapeutic procedures it seems probable that a middle ground will be established.

In approximately 100 cases I have met with no accidents or untoward results. The only complication has been a cervical sympathetic paralysis in one case. In many instances the operation has been employed in desperately sick cases with expectation only of partial symptomatic relief. Sometimes this has been obtained where least expected, at other times no benefit has occurred. In a few instances mild gastric symptoms have followed paralysis of the left half of the diaphragm, and, on the other hand, I have seen very distressing gastric symptoms relieved by the operation. At the present time, I believe that the phrenic nerve should be interrupted in conjunction with practically every paravertebral thoracoplasty. In most instances the phrenic operation should precede the thoracoplasty by several months, enabling the patient to derive the maximum benefit before undergoing the major procedure. I believe phrenicectomy should be used in cases of artificial pneumothorax where adhesions, particularly at the base of the lung, preclude complete collapse and are found unsuitable for division at thoracoscopy. In cases of acutely progressing disease, predominantly unilateral, where pneumothorax is found impossible and the patient is too sick for thoracoplasty, phrenicectomy may help. At times in frankly bilateral terminal cases with harassing cough and a great deal of sputum, a temporary paralysis of the nerve on the worse side will markedly alleviate distressing symptoms. Statistics will not answer the question of the indications for phrenicectomy for many years to come, but I feel certain that in properly selected cases it is a valuable form of treatment. It must be borne in mind, however, that phrenicectomy is in no way a substitute for artificial pneumothorax or thoracoplasty. The collapse obtained through its use is relatively slight. In fact, one of the chief dangers of the operation is that a patient becomes so encouraged by the temporary improvement that the use of more effective and permanent measures is postponed until the golden opportunity is lost.

INTRAPLEURAL PNEUMOLYSIS

I cannot speak from personal experience in discussing the problems of therapeutic pneumothorax but it appears to me that there is a growing dissatisfaction among my medical colleagues concerning the results that are achieved by this method when a considerable portion of the lung remains held out by adhesions. The results are particularly unfortunate when these adhesions are in the neighborhood of a large cavity which remains open despite the partial pneumothorax. The clinical impression regarding the unsatisfactory results of partial pneumothorax seems well supported by the figures of Matson. The situation in this type of case is a difficult one

because very often the patient has experienced considerable clinical improvement, giving encouragement, not only to himself, but to the doctor. Further interference is likely to be postponed, very frequently at the insistence of the patient, until the spread to the contralateral lung or the development of a mischievous pleural effusion makes such interference impossible. I believe that a patient is in a very precarious situation when, with an incomplete pneumothorax, he continues to run a cough with the expectoration of positive sputum. This is particularly true if a large cavity remains uncollapsed. I am not competent to express any opinion regarding the advisability of the induction of positive pressure for the stretching of these adhesions.

The relative safety of the Jacobaeus method for closed intrapleural pneumolysis by the use of a cautery has been well demonstrated and this operation must take its place in our armamentarium. The technical aspects of this procedure are exceedingly difficult and the final decision as to whether a given adhesion can be cut must be based upon a survey of the pleural cavity with the thoracoscope. The single string-like adhesions are handled with comparative ease and safety and the results following the procedure in these cases may be extremely brilliant. If it is found impossible to sever the adhesions because of their extent or proximity to a thin-walled cavity, other procedures such as interrûption of the phrenic nerve or thoracoplasty are to be considered. On rare occasions we may meet with a case in which the situation is so critical that an open pneumolysis becomes justifiable. When thoracoscopy and phrenic nerve interruption have failed to accomplish the results and the patient is too sick for a thoracoplasty, if there is any chance of being able to cut the adhesion by direct vision after resection of a rib, I should not hesitate to recommend this procedure.

CASE III

I. C. (M. G. H. No. 309442)—Artificial Pneumothorax. Closed Pneumolysis. (Fig. 1.)

Age 16. Onset with cough and hemoptysis in March, 1929. The patient was sent to the Rhode Island State Sanatorium where she made distinct

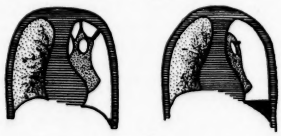


FIG. 1.

clinical improvement. In May, 1930, pneumothorax was instituted. X-ray films showed pleural adhesions holding open a large cavity in the apex. Thoracoscopy was performed on October 18, 1930 and repeated on November 4. It was possible to sever the adhesions thereby establishing complete collapse of the lung. The patient returned to the Sanatorium for continuation of pneumothorax therapy. Considering the grave prognosis that must be accorded a patient of this age with cavitation, it seems probable that her best chance for life lay in producing the collapse of the lung she now has.

CASE IV

B. B. (M. G. H. No. 309443)—Artificial Pneumothorax. Closed Pneumolysis. (Fig. 2.)

Age 28. Onset with a sudden hemoptysis in October, 1928. Entered Wallum Lake Sanatorium where she remained for 6 months. She then went home for 11 months, not maintaining a good régime. She returned to the Sanatorium and artificial pneu-

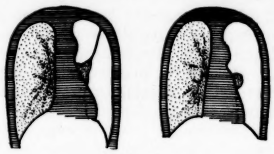


FIG. 2.

mothorax was instituted. She improved considerably but still maintained a cough and positive sputum. X-ray films showed one long string adhesion running to the apex.

On October 17, 1930, the adhesion was severed with the cautery. On the surface of the lung just at the base of the adhesion was an ulcerated area —presumably tuberculous.

Her cough has completely disappeared and she is making splendid progress with a complete pneumothorax. The progress in this case shows that pneumolysis may be indicated even though no cavity is visible in the x-ray film.

CASE V

H. W. (M. G. H. No. 313815)—Artificial Pneumothorax. Closed Pneumolysis. Phrenicectomy. (Fig. 3.)

Age 27. Onset in July, 1930, with high fever and cough. Entered Wallum Lake Sanatorium August 16, 1930. Because of the severity of her symptoms an artificial pneumothorax was induced on the left side on September 15, 1930. During the following three months the patient made slow but distinct improvement. X-ray films show that a large cavity

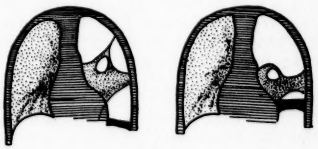


FIG. 3.

was still uncollapsed because of a string adhesion running to the apex. There were also broad basal adhesions. The cough remained very troublesome and the sputum positive. On May 26 the string adhesion was severed with the cautery and on June 2 the left phrenic nerve was evulsed because of the basal adhesions. She had immediate and complete cessation of cough and sputum and returned to the Sanatorium for a continuation of pneumothorax therapy.

CASE VI

K. N. (B. M. No. 1429)—Artificial Pneumothorax. Phrenicectomy. Thoracoscopy. Two-Stage Thoracoplasty. (Fig. 4.)

Age 37. Developed pulmonary tuberculosis in 1914. After twenty months' sanatorium régime her disease was arrested. In 1925 as a result of overstrain at work her process was reactivated and she went to a sanatorium for 1 year. Since that time an excellent régime has been followed at home. During the past year several injections of air have been given but complete collapse was prevented by adhesions. A positive pressure was maintained with refills of 400 c.c. of air every 12 days. She was referred by Dr. Andrew Peters for thoracoscopy.

FIG. 4.

Inspection of the adherent area showed a short adhesion of large diameter which was not cauterized because of the proximity of the cavity. Two other adhesions were seen which are not visible in the x-ray film. On October 17, 1930, the right phrenic nerve was interrupted. This was followed by a slight decrease in cough and sputum. She now raised about 1 oz. a day. On November 6, 1930, sections were removed from the upper 6 ribs, and on November 26 the lower ribs (7-10) were removed. There was marked alleviation of cough and sputum almost immediately. Her course subsequently has been one of steady improvement. The cough has entirely ceased and her sputum is less than 1 dram in 24 hours, and negative. Her appetite is excellent and general condition much better than before the operation.

CASE VII

M. C. (B. C. H. No. 587836)—Artificial Pneumothorax. Phrenicectomy. Thoracoscopy. Open Pneumolysis. (Fig. 5.)

Age 32. In December, 1927, onset with hemoptysis, severe cough and positive sputum. Entered Rutland State Sanatorium in February, 1929, where pneumothorax treatment was instituted. A large cavity at the right apex remained uncollapsed because of adhesions. The left lung showed diffuse infiltration extending outward from the hilum. On July 2, 1929, the right phrenic nerve was evulsed and on July 19 the adhesion was surveyed with the thoracoscope. It was too short and broad to cut with the cautery and as the contralateral disease made thoracoplasty impossible, open pneumolysis was performed. A segment of the third rib was removed and the adhesion severed under direct vision. Before the operation the patient was coughing continually and raising 4 to 5 ounces of sputum in 24 hours. The cough was relieved almost immediately and the sputum diminished so that 4 months later she was sputum free. The process in the opposite lung cleared rapidly and she is now an ambulatory patient.

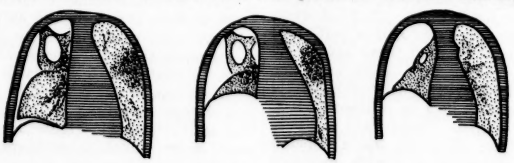


FIG. 5.

The procedures that I have outlined to you are not to be considered as alternative methods of treatment. Usually they are employed successively or in conjunction in the same case. All are based upon the fundamental principles of rest, relaxation and compression of the diseased lung—principles of treatment that were introduced into the treatment of tuberculosis when Forlanini first injected air into the pleural cavity.

NOTE: The illustrations in this article are tracings taken directly from x-ray films.

CHAIRMAN REMICK: The discussion of Dr. Churchill's paper will be opened by Dr. Ernest B. Emerson, of Rutland, Mass.

DISCUSSION

DR. EMERSON: I can add very little to Doctor Churchill's excellent paper except to say that I agree with him.

The question of when a case should be operated on is not always clear to me. Going back thirty odd years or more, when I was in medical school, I heard all sorts of lectures and discussions as to when to operate on appendicitis. There were certain types of appendicitis which were supposed to be treated, as I understood at the time, by the medical man. Then they passed over the line and became surgical cases. I think that now appendicitis is considered a surgical disease and a problem for the surgeon to deal with from the beginning.

Tuberculosis has been, up to within a very short time, distinctly a medical problem. Just when the internist should let go of the pulmonary case and turn it over to the surgeon is the question. We know that some of these cases are going to get well without any treatment whatever. We know that with adequate sanatorium treatment a great many more are going to get well. Whether the time is coming when the pulmonary case will be turned over to the surgeon forthwith, I do not know. At present I question it. However, there should be the closest teamwork between the internist, the roentgenologist and the surgeon.

It seems to me that before surgery is consid-

ered, the patient should be under observation for a considerable period of time: observation as to his general condition and symptoms, and as to whether he is improving, and a long series of x-ray films and physical examinations to check with the films. Even then it is often difficult to say whether the patient is going any further under medical treatment.

I feel that after a patient has had adequate treatment, and I mean by that proper treatment, rest in bed, graduated exercise, diet and what not, and we have reached a stage where he is at a standstill, with the disease localized in one lung, or at least very slight involvement in the opposite lung, then surgery should be considered.

I agree with Doctor Churchill that artificial pneumothorax is the first operative procedure, and we need not wait any great length of time before instituting this treatment. I think we should wait before adopting radical surgical procedure. There is no question that with artificial pneumothorax, unless complicated by adhesions, you obtain a better collapse than with phrenicectomy or thoracoplasty. The operation is usually devoid of any great danger although it may be followed by very disagreeable symptoms and occasionally disaster. I have known of two cases dying on the table. Nevertheless, I believe it is the operation of first choice. We have had 49 phrenicectomies and 24 have been definitely improved. If you ask a patient six weeks after phrenicectomy has been done, he will say frequently that he feels better; ask him six months later and he will be in doubt. Phrenicectomy has helped most in those cases where the lesions have been basal rather than apical: cough has become less frequent and sputum reduced. There were two cases with basal lesions where there was no help and four cases where no material change was noted.

In the thoracoplasty cases, phrenicectomy has been done prior to the thoracoplasty.

I believe phrenicectomy has a place, and I believe thoracoplasty has a place. Of 21 thoracoplasties in the last two years and a half, four are doing full-time work, and those cases were getting nowhere. There were seven cases improved at the end of eight months; they might possibly have been classified as quiescent; it is just a matter of degree. Three have not been improved. Two have died; one was a hopeless case and was recognized as such with operation as a last resort, and the other died from a complicating cause. There are four cases of less than six months' standing which I have not considered, although one definitely is doing well.

CHAIRMAN REMICK: The discussion will be continued by Dr. Harlan F. Newton of Brookline.

DR. NEWTON: The first thing I would like to emphasize is that in the treatment of pulmonary tuberculosis it is of enormous essential value that the decision as to the form of treatment to be instituted shall not be arrived at from the opinion of a single man. While it is of great importance to consider a patient from the standpoint of his general condition, tuberculosis elsewhere in his body, and his reaction to medical therapy, subjecting him to a continued period of such treatment with pneumothorax if possible—at the same time, during all of that period, he should be under the care of both surgeon and internist.

I would like to say a word about radical phrenicectomy combined with partial paravertebral thoracoplasty. When artificial pneumothorax is unsuccessful, complete paravertebral thoracoplasty in two stages offers the best chance of arresting the disease. However, there are many times, as Dr. Churchill has brought out, when the surgeon is in a quandary as to whether the upper or the lower portion of the lung should be collapsed first. I agree absolutely with Dr. Churchill in saying that I think the diseased portion of the lung should be attacked first, whether upper or lower. In many cases that he presents, I notice that phrenicectomy was done first and that frequently only a partial thoracoplasty was done on the upper six to seven ribs later. I think it is a procedure that warrants a great deal of merit, for not only does one obtain by an initial radical phrenicectomy a possible favorable influence upon the diseased lung itself, with improvement of the general condition of the patient, making the individual a better operative risk, but it is also an operation which can be more or less forgotten for a period of time so long as the patient is showing improvement. When the patient is not showing improvement, however, and the disease is chiefly in the upper portion of the lung, the combination of phrenicectomy with resultant compression of the lower lobe and a resection of the upper six to seven ribs is a most effective procedure.

There is considerable evidence in the literature to show that a partial extrapleural thoracoplasty with resection of the ribs over either the upper or the lower portion of the chest alone is not attended with favorable results, as the latent lesions in the essentially undiseased portion of that same lung are likely later to manifest active disease. Hence a partial thoracoplasty alone cannot be considered as an effective operative procedure, but in conjunction with initial radical phrenicectomy I believe partial thoracoplasty will prove of great value.

MR. KIERNAN: Yesterday, at a meeting of the Massachusetts Tuberculosis League, a testimonial to Dr. Otis was given, and part of that testimonial was a letter of appreciation for his many years of service in the field of tuberculosis. All of those present signed this letter. I thought most of you who are here today would like the privilege of signing this testimonial to

Dr. Otis. It will be left with Dr. Remick, and those of you who would like to may add your signatures to it.

CHAIRMAN REMICK: I regret very much to inform you that the next paper on the program cannot be presented owing to the illness of Mr. Sampson. I am glad to say that we were fortunate in securing another speaker, although the subject had to be changed.

The next paper "What We Have Learned in Massachusetts From the Ten-Year Program" will be read by Dr. David Zacks of Brookline.

WHAT WE HAVE LEARNED IN MASSACHUSETTS FROM THE TEN-YEAR PROGRAM

BY DAVID ZACKS, M.D.*

PULMONARY TUBERCULOSIS IN ADOLESCENCE

THE clarification in the past few years of the dual concept of childhood and adult type of tuberculosis has been an important contribution to the understanding of this complex disease. The classification, however, which has been based on this concept is subtle, cumbersome and on the whole, confusing, and is in need of simplification. The confusion which exists is due, I believe, to the use of clinical and prognostic terms in the description of the anatomic lesions revealed by the roentgenogram. Since the classification is based principally on the x-ray film, it is suggested that the words used be descriptive of what is actually seen in the film and not such modifying terms as "minor", "grave", "benign", "latent", "manifest", "healed", "concealed", "focal", "scars", etc. Divorced from this doubtful clinical and prognostic terminology, the roentgenogram reveals two lesions, or their combination, as follows:

A Nodular Lesions
- a. Parenchymal
  - (1) Calcified, (2) Uncalcified } Ghon's tubercle, single or multiple, in the pulmonary parenchyma.
- b. Tracheobronchial
  - (1) Calcified, (2) Uncalcified } Single or multiple along the tracheobronchial tree.

B Infiltrative lesions
- a. Subapical
  - (1) Childhood type (or early)
  - (2) Adult type (or late)
- b. Apical
  - (1) Childhood type (or early)
  - (2) Adult type (or late)

C Combination of the above.

The greatest confusion arises in the interpretation of the infiltrative lesions. It is not always possible to decide on the first film whether the lesion is of the childhood or adult type, or non-tuberculous. Dr. McPhedran's most excellent description of these chronic lesions is of the greatest aid in their differentiation. Practically, however, as any infiltrative lesion needs the most careful treatment under competent supervision, it should be left to subsequent films to decide their true nature and guide the management in each case. It may be said that the early infiltrate tends to complete resorptions or, more frequently, to resorption with residual parenchymal calcified nodules or fibrous interlobar strands or both. Indeed, these residual changes are in most instances the only evidence left which identifies the early infiltrate in children of school age. The adult type, or late infiltrate, tends in most instances to slow progression and is characterized by fibrosis, excavation or both. The late infiltrate in most instances is observed first in the apex but its localization may be subapical. When its localization is subapical, we have observed it to progress more rapidly to cavitation than the apical lesion which progresses more slowly downward. W. Pagel[2] has suggested that bronchitic lesions in the apices are more likely due to an exogenous inhalation infection. The same observation has been emphasized by Opie[3]. However, we have observed the appearance of the late infiltrate in many children with the nodular lesions although the presumably outside source of contagion had been terminated by death, in some instances after many years.

SIGNIFICANCE OF THE NODULAR LESIONS

In Massachusetts these lesions are found in two out of every one hundred school children. We look upon them as significant, regardless of their size or number, for they denote, in most instances, a source of infection close at hand. In the series of adult type lesions reported here, these lesions were observed in associations in 66.3%; more frequent in the same than in the contralateral lung. Yearly these children are given a physical examination and roentgenogram. As a group they are twice as prone to develop the adult type of disease as a control Pirquet-positive group without demonstrable x-ray evidence, as shown statistically by Pope[4]. Of those who have developed the late infiltrate in this series, 73.9%, however, came from families with known contagion in the home. Each child who has progressed is, of course, a failure in prevention. These failures will continue until we come to a fuller realization, in the first place, of the danger of contagion in the home, and, in the second place, of the importance of

*Zacks—Supervisor of Clinics, Massachusetts State Department of Public Health. For record and address of author see "This Week's Issue", page 549.

the nodular lesions per se. The best way to combat these failures would be to register with Boards of Health cases of pulmonary tuberculosis just as soon as they come under our observation. Boards of Health, on the other hand, must realize more fully their responsibility in the prevention of this disease by providing more adequately equipped dispensary service for the application of the newer knowledge in the finding of tuberculosis. Children who exhibit these lesions, if sub-standard in health, should receive preventorium care or its equivalent as to rest, diet and proper regulation of activities. The most important consideration is the breaking of "contact" for children of any age. In Massachusetts there are 700 beds for the care and education of these children.

SIGNIFICANCE OF THE INFILTRATIVE LESIONS OF ADULT TYPE

One in every thousand school children in Massachusetts is found with the adult type of lesion. This contribution is an analysis of 110 such children. Eighty-seven (sixty-seven girls and twenty boys) were classified as adult type on the first observation. Of the remaining twenty-three children, twenty (fourteen girls and six boys) exhibited the nodular lesion on an average of 3.8 years for boys and 3.5 years for girls, before the late infiltrate made its appearance. Three girls on whom the initial film was negative were kept under observation because of positive Pirquet and "contact".

TABLE 1. One boy was found with the adult type of lesion for every 2.8 girls. This lesion may occur at any age. The average in this series is 13.4 years. Among the girls, one was seven years old, eight were ten years, six were eleven years, twelve were twelve years, thirteen were thirteen years, sixteen were fourteen years, fourteen were fifteen years, five were sixteen years and six were seventeen years or over. In the boys one was eight years, one was nine years, two were ten years, four were eleven years, one was twelve years, four were thirteen years, six were fourteen years, three were fifteen years, five were sixteen years and two were seventeen years or over. Approximately two of every three children were exposed to a known source of contagion in the home. In 77.1% of these children there was present a persistent substandard weight for height and age. The girls always show the greater tendency to underweight. 80.9% of the girls and 68.9% of the boys were persistently underweight. It is significant that average weight or even overweight does not preclude the possibility of the adult type of tuberculosis.

TABLE 2. This shows the distribution of the adult type of lesion as well as the associated nodular lesions which are designated "childhood type" for the sake of brevity. For the

TABLE 1

SEX, CONTACT, AVERAGE AGE AND WEIGHT

	Number	Average Age	Number Contacts	Number Contacts Unknown	Per cent. Contact	Per cent. Contact Unknown	Average Weight for Period of 4.6 Years		
							Normal	90% of Normal	85% of Normal
Boys	29	13.4	18	11	62.0	37.9	9 (31.0)	13 (44.8)	7 (24.1)
Girls	81	13.5	53	28	65.4	34.4	16 (19.7)	30 (37.0)	35 (43.2)
Total	110	13.4	71	39	64.5	35.4	25 (22.7)	43 (39.0)	42 (38.1)

TABLE 2

DISTRIBUTION OF INFILTRATIVE LESIONS (ADULT TYPE) AND ASSOCIATED NODULAR LESIONS (CHILDHOOD TYPE)

Distribution	Adult Lesion Boys	Per Cent.	Associated Child-Lesions	Child-Type Preceding by 3.8 Yrs. (Aver.)	Total Child-Type	% Associated Child-Type	Adult Lesions Girls	Per Cent.	Associated Child-Lesions	Child-Type Preceding by 3.5 Yrs. (Aver.)	Total Child-Type	% Associated Child Type	Adult Lesions Boys and Girls	Associated Child-Type	% Child-Type
Right Top	13	44.8	6	3	9	69.2	14	17.2	10	4	14	100.0	27	23	85.1
Left Top	10	34.4	2	2	4	40.0	28	34.5	15	8	23	82.1	38	27	71.0
Both Tops	6	20.6	3	1	4	66.6	38	46.9	17	2	19	50.0	44	23	52.2
Basal	0		0	0	0		1	1.2	0	0	0		1	0	0
Totals	29	99.8	11	6	17	58.6	81	99.8	42	14*	56	69.1	110	73	66.3

*Three were x-ray negatives.

same reason "right top," etc., is used instead of "right apex," etc., because the lesions in some instances were localized below the apex. In the eighty-one girls, the subapical location was observed in twenty-three instances. (28.3%.) In the twenty-nine boys, this location occurred in five instances. (20.6%.) The total number of subapical lesions, then, was 28 or 25.4%. The girls presented nine cavities (11%); six of which were below the apex. Two boys were cavity bearers (6.8%) and none was subapical. Note the preponderance of the bilateral lesions in the girls of the same average age group and the more frequent occurrence, in boys, of the "right top" lesions. Associated lesions of the childhood type (calcified parenchymal or tracheobronchial nodes or both) were present in seventy-three instances or 66.3%.

TABLE 3

BASIS FOR DIAGNOSIS 110 CHILDREN*

	Boys	Girls	Total	Per Cent.
X-ray	15	45	60	54.54
Râles and X-ray	5	16	21	19.09
Râles, Symptoms and X-ray	7	17	24	21.81
Symptoms and X-ray	2	3	5	4.54
Totals	29	81	110	99.98

*All but four were Pirquet positive (two were x-rayed for contact—one for chronic cough—one on account of râles).

TABLE 3. This table emphasizes clearly that the roentgenogram is the most important single factor in the discovery of tuberculosis in the "teen age". The cost of x-raying all school children routinely is, at present, considered prohibitive. In Massachusetts, we use the von Pirquet as a screen and x-ray the reactors. This method of applying tuberculin has been recently criticized as too uncertain and inaccurate and the intradermic method is advocated. Dr. Joseph Aronson of the Phipps Institute and I have recently compared these two methods by simultaneously testing a representative group of adults and school children. The results will be published. We have found the von Pirquet compares favorably with the intradermic dose of .01 mg. O. T. and either test will discover 90% of significant pathology. With the 1.-mg. dose, from 20 to 25% more reactors will be found for every age group and none of the lesions will be "missed". For certain practical considerations, such as cost and "sales resistance", the universal application of the intradermic test and retest method cannot at present be used routinely in the field.

This table further shows that râles were found more frequently than symptoms referable to the chest, such as cough and expectoration. Râles on the average appeared 2.6 years after the roentgenogram demonstrated the lesion. Cough and expectoration appeared on the average three years after x-ray evidence. The most frequent and constant symptom was cough. Hemorrhage as an initial symptom occurred in three instances. Cervical adenitis was present by scar in three children. Positive sputum was found in five children; in one, 3.2 years after the x-ray evidence. Before cough and expectoration become objective, the child may complain, in some instances, of easy fatigue. Occasionally a statement of feeling discomfort under the scapula may be volunteered. In over one half of the instances, however, it should be emphasized that there is no symptom and no signs; only a chance x-ray film calls attention to the child's cloudy future. There is, however, in the majority a persistent and significant failure to attain the average yearly increment in weight, though not in height, for age, and this is of more frequent occurrence in the girls.

Regarding the frequent absence of objective signs and symptoms in these children under discussion, I quote this letter from a physician in reply to a recommendation that Edith B. be sent to a sanatorium for treatment because she showed a steady progression of her lesion by x-ray. Case 3 of the illustrations: "I have kept Edith B. under observation for a long time. At long intervals, I have examined her very carefully and I must confess that, so far, I have failed to find any evidence of tuberculosis in her chest. In all my examinations I have found that she is just as strong, that she can take as much exercise and does not tire any more easily than the average fast growing girl of her age. She has a very good appetite, eats the proper food, sleeps well and does not cough or sweat. Her pulse and heart action are good and her temperature is uniformly slightly subnormal. During the past five years, her general health and physical condition have steadily improved. The one damning fact is that her mother did die recently of tuberculosis after a prolonged illness with advanced pulmonary tuberculosis. Even with a consumptive in the family for years, they lived under relatively good conditions. Mrs. B. was an exceptionally clean and careful woman."

TABLE 4. This shows what has happened to this group under discussion, the children of which were discovered with the adult type of lesion in routine school survey, at least half of them without signs and symptoms. As has been repeatedly reported, the girls show twice the mortality for the same average period of observation. The average duration of life of those who died was 3.2 years after the first diagnosis. (The minimum was six months and the maximum seven years.) The mortality was not greater for the children with the subapical lesions. Since this table was prepared, two additional deaths have occurred; one a boy, the other a girl. This raises the mortality to 24%. It is significant that the majority are slowly progressing. Only 25%

show a lesion which on serial x-ray appears to be stable, at this writing. It may be as has been suggested, that more prolonged bed rest supplemented by early pneumothorax, before symptoms appear, will better this mortality. Are we prepared to meet the challenge?

TABLE 4

RESULTS 4.6 YEARS LATER

	Number	Dead		Progressed		Stable		Unknown	
		No.	%	No.	%	No.	%	No.	%
Boys	29	3	10.3	14	48.2	10	34.4	2	6.8
Girls	81	19	23.4	39	48.1	18	22.2	5	6.1
Total	110	22*	20.0	53	48.1	28	25.6	7	6.3

*Two additional deaths (one boy, one girl) have occurred since the table was made.

TABLE 5

FAMILIES OF CHILDREN WITH ADULT TYPE OF LESION

	Contact						Contact Unknown						Combined					
	No. Families	No. Persons	No. Pul. Tbc.	No. Pul. Deaths	% Morbidity	% Case Mortality	No. Families	No. Persons	No. Pul. Tbc.	No. Pul. Deaths	% Morbidity	% Case Mortality	No. Families	No. Persons	No. Pul. Tbc.	No. Pul. Deaths	% Morbidity	% Mortality
Boys	17	105	44	21	41.9	47.7	11	63	11	1	17.4	9.0	28	168	55	22	32.7	40.0
Girls	52	317	133	66	41.9	49.6	27	136	27	3	19.8	11.1	79	453	160	69	35.2	43.1
Total	69	422	177	87	41.7	49.1	38	199	38	4	19.0	10.5	107	621	215	91	34.6	42.3

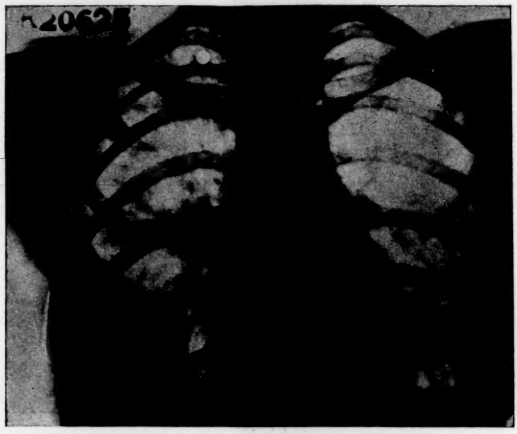
CASE II—FILM 2.

CASE II. No. 14865.

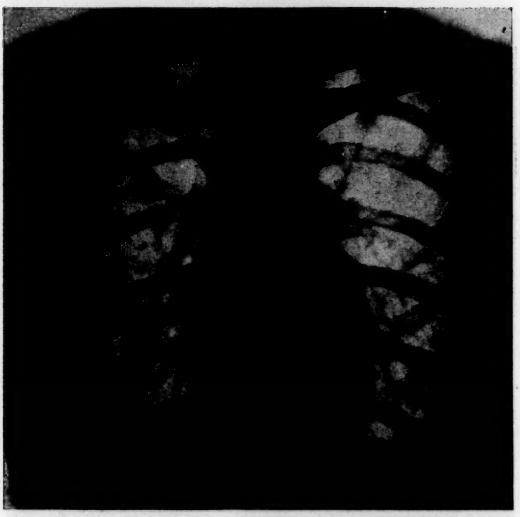
March, 1927. First observation. Girl 16 7/12 years. Father and brother died from pulmonary tbc. One sister, childhood type.

Film 2. Right: Infiltrate to 2d ant. rib with small cavity in apex. Left: Infiltrate to 2d ant. rib with soft area in 3d ant. interspace. Associated calcified nodular lesion in left apex and glands (indistinct) in left hilus. Apparent displacement of mediastinum to left due to rotation. Râles in right. In school. Sanatorium recommended but refused.

Dead. August 21, 1929. Pulmonary tbc.



CASE III—FILM 3.



CASE III—FILM 3A.

CASE III. No. 20625.

April, 1928. First observation. Girl 12 1/3 years. Contact denied.

Film 3. Infiltration throughout right lung. Suggestion of cavity in 2d anterior interspace. (Spots are ink.)

P. E.: Dullness and increased breath sounds over right. Weight 90%. Pirquet +.

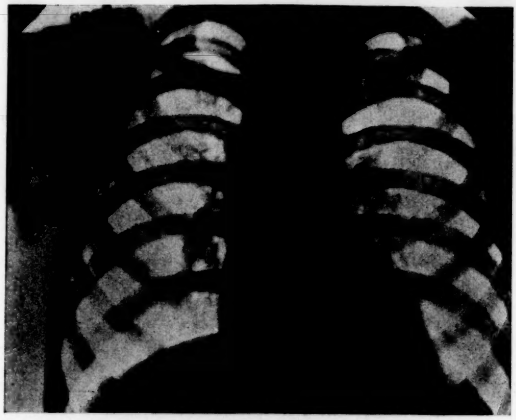
April, 1929. Right lung probably some clearing, otherwise same. Infiltration appeared in left apex.

P. E.: Râles now present in right top. No symptoms referable to chest. Weight 93%. Mother suspected of tuberculosis by nurse.

Film 3A. January, 1930. Right lung same as 1929. Progression in left apex more definite.

P. E.: Râles right and left tops. Denies cough and expectoration. Weight 100%, but frequent colds and tires easily. Mother reported pulmonary by death certificate.

Girl now in a county sanatorium.



CASE V—FILM 5.

CASE V—FILM 5A.

CASE V. No. 15137.

June, 1927. First observation. Boy 13 3/4 years. House contact definitely absent.

Film 5. Nodular lesion left apex. Large calcified nodule in 2d ant. right interspace with glands in right hilus. V. Pirquet +. C. adenitis at age of 5, present by scar. Weight 100%.

April, 1928. Weight 100%. Râles in right top. X-ray, April, 1929, same as June, 1927.

Film 5A. December, 1929. Lesion appeared in left to 2d ant. rib. In school and apparently well.

January, 1930. Fever with cough. Râles both tops. Progressed rapidly. Spontaneous pneumothorax.

Dead May 5, 1931.

TABLE 5 shows the significant results of a searching study of the families of these children. The 110 children represent 107 families. In most instances, their families are large; the average number of persons per family is six. The families are of poor economic level and usually broken by one or more deaths from pulmonary tuberculosis in the contact group. In 69 families, there has been on the average 2.5 pulmonary tuberculosis cases per family. The results of this table may be summarized briefly in this way. Two of every three children in this series come from families with a pulmonary tuberculosis morbidity of 41% and tuberculosis case mortality of 49%. It is not unlikely that further search in the 38 families of the "unknown contact" group may reveal the source. This table emphasizes, I hope, conclusively, the danger of contagion in the home to children of any age.

Illustrations are presented to help visualize the type of lesion which is discussed in this paper.

CONCLUSIONS

(1) The multiplicity of terms used in the classification of tuberculosis is confusing. It is suggested that descriptive terms be limited to what is actually seen in the roentgenogram without attempting to read into the film either the past or the future.

(2) In children of school age, one in every thousand is found with the adult type of lesion. For every boy, 2.8 girls are found. About five years later, at least 24% of these are dead, the girls showing double the mortality of the boys.

(3) In girls, this lesion progresses more rapidly than in boys for the same age group and period of observation as attested by the following:

(a) Greater frequency of bilateral lesions for the same average age.

(b) Greater frequency of cavitation.

(c) Double the mortality for the same period of observation.

(4) The subapical infiltrate shows more rapid and frequent cavitation than the apical.

(5) The apical lesion in adolescence is not insignificant as reported. This is shown by results in Table 4.

(6) 54% of the lesions under discussion are found on x-ray evidence before signs and symptoms which appear later, the signs (râles) very frequently before the symptoms.

(7) To better the mortality, treatment should be given before symptoms appear, especially when the roentgenogram shows the lesion to be progressing.

(8) Two of every three children with the adult type of lesion come from families with a tuberculosis morbidity of 41% and a case mortality of 49%. This points to home contagion as the greatest danger to youth of any age.

(9) In a serious attempt to prevent pulmonary tuberculosis in adolescence, we must proceed:

(a) To discover the nodular type of lesion in children and give treatment to those who are substandard in health.

(b) To break "contact" when contagion exists in the home, as this is the source of greatest danger to children of any age. Furthermore these children should be kept under prolonged supervision even though the first roentgenogram fails to show any pathology.

(10) When a case of tuberculosis comes under our observation, it is our responsibility to examine all the members of the family, physically, and by roentgenogram. For the poor, Boards of Health should provide adequate diagnostic service and periodic follow-up.

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CHAIRMAN REMICK: May I ask for the Nominating Committee's report?

DR. GRIFFIN: The nominating Committee submits as its nominations for officers for next year, Dr. Sumner H. Remick, of Waltham, as Chairman, and Dr. Roy Morgan, of Westfield, as Secretary.

CHAIRMAN REMICK: I thank you for the compliment but question whether the by-laws permit the renomination of the Chairman.

DR. GRIFFIN: That has been the custom for years.

CHAIRMAN REMICK: The Chair stands corrected.

(On motion duly seconded it was voted that the Secretary cast the unanimous ballot of the section for the officers as reported by the Nominating Committee.)

CHAIRMAN REMICK: I will ask Dr. Moses Stone of Boston to discuss Dr. Zacks' paper.

DISCUSSION

DR. MOSES J. STONE: I regret very much that I had no opportunity to study Dr. Zacks' paper and to digest his subject more thoroughly.

He has given us many facts and figures concerning the prevalence of tuberculosis in Massachusetts, all of which are interesting and extremely illuminating. These facts and figures

represent an outlay of money running into many hundreds of thousands of dollars on the part of the State Treasury. The expenditure of this money will be very much worth while if we make practical use of the results of Dr. Zacks' investigations.

We have learned this afternoon that 54% who have shown definite lesions on x-ray examination, showed absolutely no signs or symptoms on physical examination. This should be of immense interest to the practicing physician, bringing home to him the importance of x-ray examination. Another fact has been brought out, that the mortality rate so far in this group is 24%—an extremely high death rate. This emphasizes the importance of early treatment in the parenchymatous type of pulmonary lesion. I have frequently found that the subapical type of lesion, which is usually an extension of the tuberculous process in the hilum region, has a tendency to spread and caseate much more rapidly than the supraclavicular or apical lesion, also known as the adult type. In these cases, (the parenchymatous type of lesion in children) no time should be wasted and early and aggressive treatment is indicated, especially early hospitalization, and collapse therapy.

Dr. Zacks has also shown us that one in a thousand apparently healthy school children has the *adult active type* of pulmonary tuberculosis. This points out the importance of the school as a source of contagion, and also throws a different slant on our campaigns. Examination of the children should be made not only for early foci of infection, but also for the removal from school of those who may be carriers of the disease. It was also found that two in every hundred showed the nodular type of tuberculosis, a group of children requiring special care and observation.

When Dr. Chadwick organized the so-called Ten-Year Program for Massachusetts, many wondered whether the State ought to go into such a venture, and some even looked upon him as an enthusiast. I believe that the paper read this afternoon justifies the vision and the courage of Dr. Chadwick.

If Mr. Kiernan of the Massachusetts Tuberculosis League is present, I should like to remind him that there is a big job now ahead of him. Education of the public is more necessary now than ever. With the rapid decline of the tuberculosis death rate, there is apt to be a certain apathy or indifference in the minds of our city fathers as to the expenditure of money for the prevention of tuberculosis. We must emphasize the fact that tuberculosis is not only a problem of the home, but definitely a school problem too, and that it can easily be discovered by the routine von Pirquet test and x-ray examination of the reactors.

The State has led the way. It has shown us the existing tuberculosis problem and the best way for solving it. It is now up to the municipalities to take up the job, if the expenditure of the State is not to be in vain.

CHAIRMAN REMICK: Dr. Churchill and Dr. Zacks' papers are now open for discussion.

DR. STONE: I should like to ask Dr. Churchill about the advisability of severing adhesions, not for the sake of collapsing a cavity but for the sake of prevention of future perforation of the lung. I feel that every lung adhesion is a potential factor in rupture of the lung. May I ask Dr. Churchill whether he would advise cutting that adhesion as a possible preventive procedure?

DR. CHURCHILL: I have no data on which to express an opinion regarding that question. I can only refer to the second case demonstrated in the lantern slides, in which there was no cavity visible by x-ray, but there was a tuberculous ulceration on the visceral pleura at the base of the adhesion. This patient's cough and sputum ceased following the cutting of the adhesion, although it appeared from the x-ray that she already had a satisfactory collapse of the lung.

DR. LORD: This important contribution by Dr. Zacks indicates the unexampled opportunity afforded by the Ten-Year Program to add to our knowledge of the clinical aspects and outcome of tuberculosis in children. Regarding the adult type of the disease in childhood, it is surprising that the x-ray apparently affords the only evidence of the disease in so large a proportion of the cases. I would like to ask Dr. Zacks whether the temperature is elevated.

It is important to appreciate that the present investigation of tuberculosis in children by the State affords an unusual opportunity which may never come again and puts a great responsibility upon the physicians of the State, to investigate other members of the families of infected children and through the knowledge thus obtained further prevent and control the disease in this community.

DR. PRATT: I should like to ask Dr. Zacks for his explanation of this shocking death rate. Here are a hundred cases recognized at the earliest possible stage of the disease, sixty of them by x-ray alone, and yet the mortality to date has been twenty per cent.

We were always taught in tuberculosis campaigns that success depended upon early diagnosis. Here at great expense the State has provided early diagnosis for school children, and yet of those one hundred cases of adult type of tuberculosis, twenty have died.

There must be a lesson to be learned from this discouraging outcome. When was treat-

ment begun? What was the treatment? How many of these cases were sent to sanatoria? How many were left in charge of the family doctor?

DR. GIBSON: Apropos of the statements of Dr. Stone on the paper of Dr. Zacks, I was quite interested in recent years, as a practitioner, to check up on some cases which were reported by Dr. Chadwick in his survey of the town of Watertown eight years ago.

At that time I was called to see a patient who had a throat infection which developed into diphtheria and tuberculous adenitis. The child was born of a tuberculous mother while she was in the very active stages. The child was sent to the Hayes Memorial Hospital and died from acute miliary tuberculosis.

There were three other cases in the family of five children. I checked up on the situation at the time and advised the father to place them in sanatoria or some place where they would have an opportunity for convalescence and possibly arrest the progress. I could not obtain coöperation from the parents, and within a period of three years two of those three children had died. The third child is living and quite actively tuberculous. This child is now seventeen years of age.

The question in my mind is how we in practice can talk over with and coöperate with officials so as to promote this program for the benefit of the children and be effective in the results that we can accomplish. We cannot take over the parental authority and demand the institutional care of the child. We can suggest the care, and yet the parent may not be coöperative.

A difficulty arises as to what procedure we should take. I wonder if Dr. Zacks could give us any information on that.

DR. ZACKS: Dr. Lord, the temperature in children we find extremely labile and do not like to depend on the casual temperature observation as a symptom.

Recently, in the Waverley School for Feeble-Minded, which includes many who are really not children, we conducted a survey. We found thirty-three cases of pulmonary tuberculosis. All were then put to bed for a ten-day period of temperature observation. In this group we could not be sure of symptoms, either subjective or objective, or physical signs, for lack of coöperation. In many cases, elevations in temperature were observed for the period studied and these we called active cases.

Dr. Gibson, in a way, has answered Dr. Pratt's question. We make a diagnosis but it is difficult to get coöperation from the family and particularly, in a good many cases, from the physician. This is because here is a child who is apparently well, and going to school, and out of a clear sky comes the report that the child has pulmonary tuberculosis. In some cases we have letters and we have made personal contact. The physician in a community is not convinced until such times as symptoms do appear. There are 54% without symptoms. These we find by von Pirquet testing and x-ray. I did not go into results of sanatorium treatment with this group. If we could get all the cases to accept sanatorium treatment immediately, we might be able to say something about the treatment, either the long bed rest or bed rest plus pneumothorax only.

Dr. Gibson's question I have to answer in the same way. It is very difficult for us to get a history of contact. It has to be investigated by home visits and that sort of thing. A good many cases are concealed. That is why I said in the paper that we should report the cases earlier.

The question comes up as to when to report a case. An analysis of the cases shows that we cannot report them too early. If the doctor looks at the case as an individual and neglects the rest of the family, I think the responsibility is his, particularly if he does not register the case with the board of health and request coöperation from the board.

CHAIRMAN REMICK: Dr. Churchill, have you anything to add to your paper?

DR. CHURCHILL: Nothing to add, sir.

CHAIRMAN REMICK: I want to bring to your attention the subject that Mr. Kiernan spoke about during the Session. If any present would like to sign the testimonial to Dr. Otis, you may do so now.

The meeting stands adjourned.

THE INCIDENCE OF UNTOWARD SYMPTOMS FOLLOWING THE INTRAVENOUS INJECTION OF SODIUM TETRAIODOPHENOLPHTHALEIN IN CHOLECYSTOGRAPHY*

BY WILLIAM E. DAVIS, M.D.†

IT is probable that everyone who has used the Graham test for cholecystography has been confronted with the problem of the not infrequent unpleasant symptoms which follow the intravenous injection of sodium tetraiodophenolphthalein. These symptoms may occur either during, or immediately after, the injection, or a number of hours later. Of those reactions immediately following injection of the dye, a few give rise to a condition of circulatory collapse with marked drop in blood pressure and loss of consciousness. While in our experience none of these reactions has terminated fatally, there is a case reported by Huddy[1] in which death followed such a circulatory collapse.

The purpose of this study was to determine to what extent, if any, the blood pressure is ordinarily affected by the intravenous injection of sodium tetraiodophenolphthalein and if the intramuscular injection of adrenalin immediately before injecting the dye would reduce the number of reactions. For this purpose a record was kept of each patient, showing the blood pressure immediately before and fifteen minutes after the injection, the patient remaining in a reclining position during this period. Three gms. of the dye, freshly prepared in 40-50 c.c. distilled water and sterilized, were injected intravenously, the injection being made at a uniform rate in 4.5-5.5 minutes. Alternating patients of the first 145 cases were given 5 minims of 1-1000 adrenalin intramuscularly immediately before the injection of the dye. Record was made of the presence and nature of any reaction occurring during the fifteen minute period following the injection and on the following morning any untoward symptoms during the night were recorded.

The results from the first 145 cases led us to abandon the use of adrenalin in the remaining 160 cases, which are recorded separately in the tables below.

*From the department of Gastro-Enterology, Lahey Clinic.

†Davis—Formerly with the Department of Gastro-enterology, Lahey Clinic. For record and address of author see "This Week's Issue", page 549.

It will be seen from Table I that in the case of patients receiving adrenalin before the injection of the dye there is a slight drop (3 mm.) in both systolic and diastolic pressure. In patients not receiving adrenalin this drop is twice as great in systolic pressure, but the diastolic pressure shows no change. The latter fact is explained by the observation in many of the individual records of a drop in systolic, accompanied by a rise in diastolic, pressure. The second series without adrenalin corresponds closely to the previous one. In examining the number of individual patients showing change in blood pressure there is a significant difference between those who received adrenalin and those who did not, only 43% of the former showing a lower systolic pressure, while 60% of the latter show a lower systolic pressure.

When we consider the comparatively slight drop in pressure in these cases it would seem that it would have little effect in producing the reactions described below. This conclusion is borne out by the fact that the proportion of those suffering reactions who have a lower systolic pressure after the injection of the dye is no greater than the proportion of the total number of patients who show lower systolic pressures. (See Table II.)

A large part of the slight drop in systolic blood pressure seen in these cases may be explained on the basis of the conditions under which the readings were taken, aside from any effect of the injection of the dye. Many of the patients were nervous in anticipation of the procedure and had a higher blood pressure than that shown from the record of their first examination at the Clinic. After the injection many of them became less nervous and this, with the fifteen minutes in a reclining position, might well bring down the blood pressure somewhat.

In only one case did the injection of sodium tetraiodophenolphthalein seem to have any significant effect on the blood pressure. This patient was a woman of 56 years, who had an

TABLE I

	Number of patients	Mean B.P. before inject.	Mean B.P. 15′ after inject.	No. with lower B.P.	No. with higher B.P.	No. with same B.P.
Cases with adrenalin	67	133/80	130/77	29	24	14
Cases without adrenalin (a)	78	133/80	127/80	47	17	14
Cases without adrenalin (b)	160	136/84	128/82	95	19	46

initial blood pressure of 210/100. She had no previous history of cardiac symptoms but showed a moderately enlarged heart and slight evidence by electrocardiogram of myocardial damage. At the termination of the dye injection she went into syncope and her blood pressure dropped to 80/40. Five minims of adrenalin were given intramuscularly, as none had been given before the dye injection, and she regained consciousness in a few minutes, the blood pressure rising to 150/80 fifteen minutes after the initial injection.

We must conclude from the above findings that the injection of sodium tetraiodophenolphthalein intravenously does not ordinarily cause a significant lowering of the blood pressure and that most of the untoward symptoms following such injection bear no relation to blood pressure changes. Further, we find that injection of adrenalin intramuscularly before the injection of the dye does not prevent or lessen the number of such reactions. In fact, in our series, of the 67 patients receiving preliminary injections, 28, or 42%, showed some reaction, while of the corresponding 78 patients without adrenalin, only 18, or 23%, showed reactions. We have no explanation to offer for the greater percentage of reactions in the patients given adrenalin. The injection of adrenalin after the occurrence of reactions with drop in blood pressure is, however, distinctly beneficial.

In the above studies we have included all untoward symptoms occurring within twelve hours after the injection of the dye. Of these, from one-fourth to one-half occur within the first fifteen minutes after injection and it is chiefly within this group that very distressing symptoms are felt. These have been designated in Table III as immediate reactions and have been further divided into marked reactions, such as syncope, choking sensation, vomiting and severe pain in the back, and mild reactions, such as nausea, dizziness, flushing and a feeling of warmth. Except for a few patients having abdominal pain during the night, all untoward symptoms occurring after the patient left the Clinic were mild and of no great significance to him. Of seventy-five patients having some type of reaction, only nine had both immediate and later symptoms.

The types of reaction shown by this group of seventy-five patients may be enumerated as follows:

Immediate reactions, marked:
- Syncope with marked drop in B.P., 1
- Syncope, momentary, 1
- Flushed, choking sensation, 3
- Flushed, tremor, sweating, 1
- Nausea and vomiting, 2
- Precordial pain, palpitation, 1
- Severe pain in back, 8

Immediate reactions, mild:
- Dizziness, 5
- Nausea, 4
- Flushing and sensation of warmth, 1

Later symptoms:
- Nausea, 25
- Nausea and headache, 5
- Nausea and dizziness, 5
- Pain in abdomen, nausea, 2
- Pain in abdomen, headache, 2
- Dizziness, 7
- Headache, 6
- Weakness, 4
- Chills and fever, 1

It will be seen from Table III that in this series 25% showed some type of untoward symptom. Of this number, however, only 9% showed a reaction within fifteen minutes after the injection. In only 5.6% were these symptoms severe enough to cause the patient any great amount of discomfort. Those occurring later were mild and for the greater part inconsequential. We have made it a rule to avoid the intravenous use of the dye in cases where there is evidence of myocardial damage or with systolic blood pressure above 180. Where previous tests with oral administration of the dye show no filling of the gall bladder, an electrocardiogram is taken on such patients before an

TABLE II

	Number of reactions	With lower B.P.	With higher B.P.	With same B.P.
Cases with adrenalin	28	9	11	8
Cases without adrenalin (a)	18	8	7	3
Cases without adrenalin (b)	29	16	3	10

TABLE III

	No.	Reac.	%	Immediate reactions	%	Marked reactions	%	Mild reactions	%	Later symptoms	%
Cases with adrenalin	67	28	42	7	10	4	6	3	4	25	37
Cases without adrenalin (a)	78	18	23	4	5	2	2.5	2	2.5	16	21
Cases without adrenalin (b)	160	29	18	16	10	11	7	5	3	16	10
Total	305	75	25	27	9	17	5.6	10	3.4	57	19

intravenous injection of the dye is attempted. To this precaution, no doubt, is due the fact that in only one case in this series was there a reaction which might be considered as potentially dangerous to the life of the patient.

The percentage of patients showing immediate reactions is practically the same as that shown in a previous series from this Clinic quoted by Adams[2]. In this earlier group there were 30 reactions in 274 cases, no account being taken of the mild symptoms which occurred during the night following injection of the dye.

The largest group with severe reactions consisted of those patients having colicky pains in the lumbar region. These were very distressing to the patient and lasted from a few minutes to more than an hour, in several cases requiring morphia for relief. Although there was no radiation to the groin or legs, it might seem from their nature that they were caused by renal irritation. There were no residual symptoms, however, after the pain was relieved.

No patient in this series exhibited any marked clinical jaundice. We have found that such patients rarely show filling of the gall bladder after injection of the dye and so have not done a Graham test on them. Dick and Wallace[3] have pointed out, both clinically and experimentally, the danger of toxic effects from sodium tetraiodophenolphthalein given either orally or intravenously to patients with biliary obstruction or hepatitis.

We may conclude from the above findings that:

1. The intravenous injection of sodium tetraiodophenolphthalein does not ordinarily cause any significant drop in blood pressure.
2. As might be expected from the preceding conclusion, there is no reduction in the number of untoward reactions where a preliminary injection of adrenalin is given.
3. About 25% of patients receiving dye injections experience some degree of unpleasant after effects, of which only 5.6% are severe enough to cause great alarm or discomfort to the patient.

We believe that the above figure for severe reactions is almost a minimum since every precaution was used to prevent reactions. To this end we avoided intravenous injection in patients showing cardiovascular disease or biliary obstruction and jaundice. In addition, care was taken in the preparation of the dye and its injection. It does not seem wise to inject the usual dose in less than five minutes injection time. Further, it has seemed that sterilizing the solution by boiling renders it more likely to cause toxic symptoms than if it is sterilized in an autoclave. This latter statement is merely our impression and no attempt has been made to verify it statistically.

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CHRONIC MENINGOCOCCUS SEPTICEMIA*

BY JAMES F. BINNS, M.D.,† AND LE ROY D. FOTHERGILL, M.D.†

CHRONIC meningococcemia has been reported relatively infrequently in the American literature. Up to January, 1931, 19 cases have been found, whereas well over 100 cases have been reported in the foreign literature. The cases in the American literature have been reported by: Warfield and Walker[1]; Cecil and Soper[2]; Bray[3]; Maxcy[4]; Herrick[5]; Morgan[6]; Bloedorn[7]; Dock[8]; Neergaard[9]; Marlow[10]; Montgomery[11]; Graves, Dulaney, and Michelson[12]; Vesell and Barsky[13]; and Master[14]. Two of these cases occurred in children.

Since Soloman's[15] first description of chronic meningococcemia in 1902, the cases subsequently reported have presented a striking clinical picture. Chalier, Giraud and Morel[16] have completely discussed this syndrome and have described the condition as a definite clinical entity. Dock, in 1924, reported the most comprehensive review of the cases occurring in the foreign literature as well as those occurring in this country.

The onset of the disease is rather sudden with chill, fever, headache, joint pains, and a rash. The fever, usually intermittent in type, ranges from 99° to 104°. Dock found that this was true in 49 of 68 cases. In 37 cases there were two day cycles; in 21, three day cycles; in 3, four day cycles. In one case there were seven consecutive tertian cycles. Morgan[6] and Rolleston[17] have both emphasized tertian and quartan fever curves. In all of Dock's cases frontal headache was a constant finding but was present only when the temperature was elevated. Over 50 per cent. of the cases have migratory joint pains. The cases of Cecil and Soper, Bray, and one of Herrick's had joint pains associated with chills and fever as the presenting complaint. While involvement of the joints is quite frequent, only 3 of Dock's 68 cases developed suppurative arthritis.

The rash, occurring usually in the first week, is of the multiform erythematous type, often with tender nodules one half to two centimeters

*From the Infants' and Children's Hospitals and the Department of Pediatrics, Harvard Medical School, Boston, Mass.
†Binns—Assistant in Pediatrics, Harvard Medical School. Fothergill—Assistant in Pediatrics and Bacteriology and Immunology, Harvard Medical School. For records and addresses of authors see "This Week's Issue", page 549.

in diameter. They may be found on the trunk, extremities and even on the face. Friedemann and Deicher[18], and Adler[19] described lesions resembling the nodules of erythema nodosum. The skin manifestations are often confusing in that lesions of varying character occur. Purpuric and petechial lesions are common. Herpetic lesions and even lenticular rose spots have been described, as well as several types of the above lesions occurring simultaneously. Nevertheless, the regularity with which the rash recurs and slowly disappears with subsidence of fever, headache and joint pains should arouse suspicion of a meningococcus sepsis. The skin lesions usually fade within 36 to 48 hours, leaving quite discolored bluish red areas. However, Morgan does not believe that chronic meningococcemia leaves the characteristic blue discoloration of erythema nodosum. While 53 of Dock's 68 cases had skin lesions, only one out of Netter's[20] 5 cases presented this sign of the disease. Chalier, Rolleston, also Renault and Cain[21], feel that this part of the picture is due to emboli of meningococci, inflammatory foci with polymorphonuclear infiltration about the arterioles. They have demonstrated the organism in the lesions of this chronic disease. Benda[22], Pick[23], McLean and Caffey[24], Brown[25], and others have found meningococci in the petechial and purpuric lesions of acute meningococcus septicemia. Adler believes from the bacteriological and histological examinations that the eruption may be of toxic origin.

Enlargement of the spleen is moderately common. Nine of Chalier's 27 cases had definitely palpable spleens. However, Dock found the incidence of splenic enlargement much less.

The development of meningitis late in the disease is not uncommon. Too often the diagnosis of chronic meningococcemia has only been made following the meningitis, usually late in the course of the disease. Nine of Chalier's patients developed this complication. Netter's patients had meningitis on the 15th, 20th, and 25th days; Marie's[26] on the 26th, 37th, and 70th days; it came on the 60th day in Soloman's case; on the 56th day in one of Morgan's cases, on the 95th in the case of Moriquand, Betaye and Charleux[27], and on the 38th day in the case of Vesell and Barsky. Although the patient of the last author revealed positive blood cultures earlier in the course of the disease, treatment was apparently not instituted until the development of meningitis on the 38th day. Graves, Dulaney and Michelson reported a recovery following two attacks of meningitis.

Early blood cultures are of extreme importance, although many cases have failed to show organisms, even when enriched media were used. Morgan's first patient had a positive blood culture on the 49th day of illness, the second on the 39th day; Neergaard's on the 31st and 41st days; Bloedorn's on the 18th day. Sixty per cent. in Dock's series had positive blood cultures for meningococci. The culture was positive in many of these only after the use of media enriched with ascitic fluid or serum water. Marlow found that in his case the organism was grown after 4 days on enriched media, and, as many others have found, growth in the sub-culture was poor.

The duration of chronic meningococcemia may be from several weeks to several months. Vignot's[28] cases lasted 85, 65, 69, 113, and 130 days respectively. In this country the case reported by Dock was of the longest duration. The patient lived 7 months, being treated as a case of gonorrheal sepsis. The diagnosis of meningococcemia was not made until necropsy. In this country the average duration of the disease has been about 3 months.

The prognosis is usually good. Sergent[29] considers meningococcus septicemia of the chronic type the most benign of the septicemias and in his observations it resulted in 90 per cent. recovery. In this country the mortality, however, has been about 25 per cent. Involvement of the heart, especially meningococcus endocarditis, has been claimed to alter the prognosis. Graves, Dulaney, and Michelson found that 2 of 3 fatal cases were the result of endocarditis. However, Master has just recently reported 3 cases, in all of which there was endocarditis with subsequent recovery. Necropsy confirmed the diagnosis of endocarditis in 4 of the 7 cases in which this complication developed, as reported in the American literature.

The literature reveals numerous methods and variations in the treatment of chronic meningococcus septicemia. Chalier recommends for adults 100 c.c. of serum daily so long as septic symptoms persist. Marlow obtained results after a total dosage of 65 c.c. given to a child 12 years old. This was diluted with saline, 15 c.c. serum to 100 c.c. of normal saline. Dilution of serum in most instances has not been carried out. Numerous cases have received enormous doses, 600 to 1000 c.c. without effect. It would seem that failure to respond to serum treatment might be due to an inactive serum or to an existing focus of infection. Herrick has reported the finding of meningococci in the accessory sinuses. When serum has failed to bring about subsidence of symptoms, numerous procedures have been attempted, especially by European practitioners. Non-specific protein shock, fixation abscess, vaccine treatment, intravenous colloidal metals, and repeated blood transfusions have been used with seemingly good results. However, the efficacy of such procedures in most instances must be regarded with some degree of skepticism, for many patients with chronic meningococcemia have recovered spontaneously. The case of Friedemann and Deicher and also that of Lundholm and Ströman[30] are just such examples of instances in which recovery took place after specific serum had failed.

Malaria, typhoid fever, subacute bacterial endocarditis, erythema nodosum, rheumatic fever with bizarre skin manifestations, Malta fever and Brill's disease all offer a problem in differential diagnosis when chronic meningococcus septicemia is being considered.

The diagnosis of chronic meningococcemia can be made positive only by demonstrating the meningococcus by blood culture. Repeated blood cultures are often necessary before a positive result is obtained. They are best taken at a time when the patient is having a rise in temperature. From 5 to 10 c.c. of venous blood should be withdrawn and introduced into a flask containing about 50 c.c. of an enriched broth. A hormone or nutrient broth containing 1 per cent. dextrose and 10 per cent. ascitic fluid is perhaps the best medium. Very often growth does not become manifest for several days. For this reason, such cultures should be incubated for a week to ten days before finally being discarded as negative.

It should be emphasized that as soon as the organism has been isolated, an effort should be made to find the most effective anti-serum for the organism. This is best done by agglutinating the organism with various lots of sera and using that serum exhibiting the highest titer. The agglutination reaction is the best criterion at the present time for determining the efficacy of a given lot of anti-meningococcus serum.

Obviously the only rational treatment of chronic meningococcus septicemia is with specific anti-meningococcus serum, given intravenously. The patient should be tested first for sensitivity to horse serum. The dosage will vary with the response made by the individual patient. In the case reported here a total of 85 c.c. was given. Other cases have been given a great deal more than this.

Failures to respond to specific serum treatment are, perhaps, most often due to the use of a serum that is not antigenically specific for the individual strain of meningococcus infecting the patient. It has been suggested also that the presence of a focus of chronic meningococcus infection may be responsible for certain failures. After treatment has been instituted, repeated blood cultures are useful in following the course of the disease.

Because of the infrequency with which this chronic type of meningococcus sepsis occurs, the following case report seems worthy of recording in the literature:

M. F., an 8-9/12 year old Italian girl, was admitted to the Children's Hospital, May 29, 1930, because of an intermittent rash and fever of one month's duration. The family and past histories were irrelevant. The onset of the present illness was one month prior to admission, with a chill and a temperature of 103°. The patient vomited once at this time but was well the next day. She went back to school, but on the third day was sent home because of a rash on her face. The lesions then appeared on her back, chest, and abdomen. The older lesions were said to have become blue and when the temperature rose, new spots appeared. The temperature varied from 99° to 103°. The child was in bed part of the time. Whenever her temperature was normal, she was up and about and felt moderately well. Headache was frequent, with elevations of temperature. During the two weeks previous to admission she complained of pain in the knees and ankles. The pain was migratory in character and two days before admission there was swelling of both ankles. On two occasions slight epistaxis occurred.

Physical examination presented a fairly well developed and nourished Italian girl with the appearance of chronic illness. There were numerous indurated erythematous lesions, papular in type, on the face, arms, legs, and buttocks. Over the same area there were some bluish discolored lesions which were evidently older. There were no bullae, vesicles, pustules or petechiae. The head, eyes, ears and nose were negative. The tonsils were small and slightly injected. The heart and lungs were entirely negative. The abdomen was large, but there was no tenderness or spasm. No fluid wave could be felt. The liver was considerably enlarged, especially to the left. It was firm, not tender, and quite smooth. The spleen was somewhat enlarged, extending almost to the mid-line and about four fingers below the costal margin. It was firm, not tender, and the splenic notch was easily palpable. The extremities were normal except for the rash described above. Neurological examination was negative. There were small palpable cervical, inguinal, and axillary lymph glands.

Blood examination on admission showed: hemoglobin (T) 70 per cent.; red blood cells 3,630,000 per cu. mm.; white blood cells 3,500. Differential count; polymorphonuclear leucocytes 50 per cent.; young polymorphonuclear leucocytes 10 per cent.; myelocytes 4 per cent.; lymphocytes 18 per cent.; mononuclear leucocytes 11 per cent.; and eosinophiles 7 per cent. A striking leucopenia persisted throughout the course of the disease. The Widal test was negative for the typhoid and dysentery group of organisms. The blood Wassermann reaction was negative. The Mantoux tuberculin test was negative. Clotting and bleeding times were normal. A flat plate of the abdomen showed an unusually large splenic shadow.

The presence of fever, rash, and large spleen suggested the possibility of a bacteremia. For this reason a blood culture was taken on admission, May 29, and again the following day. About 5 c.c. of venous blood were introduced directly into a flask containing 50 c.c. of hormone broth with 1 per cent. dextrose added. Both flasks remained clear the first few days, but on June 4th, Gram-negative diplococci were found in both flasks. The organism was agglutinated by Massachusetts State polyvalent anti-meningococcus serum in a dilution of 1:320. On June 4th another blood culture was taken, which later proved positive.

A diagnosis of chronic meningococcemia was made and treatment started on June 4th. The patient was sensitive to horse serum and an attempt was made to desensitize her over a period of about eighteen hours. On June 5th, after she had received several doses of polyvalent anti-meningococcus serum intradermally, subcutaneously, and intramuscularly, 15 c.c., undiluted, were given intravenously. The patient experienced a slight reaction. On June 6th, 45 c.c. of anti-meningococcus serum were given intravenously and on June 8th, another 25 c.c. were given. This made a total of 85 c.c. intravenously and about 15 c.c. intramuscularly and subcutaneously. On the fifth day following the injection of the first dose of serum, the patient developed symptoms of serum sickness. The temperature rose to 104°. The lymph nodes were swollen and tender

and there was a generalized erythematous rash followed by an urticaria. Within four days these symptoms had disappeared. Two days later the temperature dropped to normal and remained normal throughout the remainder of the course of the disease, except for an occasional rise to 100°. The initial skin eruption entirely disappeared, leaving only blue discolorations. Blood cultures taken on June 7th, 9th, 12th, and 17th, (all after treatment was instituted) were negative, whereas the three successive blood cultures before treatment were positive.

Because of the persistently large spleen and liver, the patient was kept in the hospital for a longer period of observation than would have been the case otherwise. The liver and spleen did not subside, but because of the patient's apparent recovery from meningococcemia, she was discharged home forty-nine days after admission.

The patient was seen in the Medical Out-Patient department at one and four months after her discharge, and at both times she was doing well except for slight nervousness and occasional vague pains in the legs. She had been attending school and leading quite an active life during the six months' period following recovery from meningococcemia. However, because of the persistent enlargement of the liver and spleen, the moderate secondary anemia, the leucopenia, and platelet counts at the lower limits of normal, she was readmitted to the hospital January 9, 1931, with a tentative diagnosis of splenic anemia of the Banti's type. After a two weeks' period of observation on the ward it was deemed advisable to remove the spleen.

Splenectomy was performed January 22, 1931. In the lesser omentum there was a very large, prominent, distended vein and others of lesser size running to the parietal peritoneum high in the left flank, forming a definite adhesion. The spleen was enlarged, running far back into the left flank. The edges were fairly sharp and notched in many places. The spleen did not deliver easily because of firm attachment in the region of the left kidney. The liver appeared enlarged and cirrhotic. The edges were blunted and the tissue felt fibrotic.

At the time of operation two sections of spleen were removed, emulsified in sterile salt solution, and planted on various types of enriched media. The material was incubated both aërobically and under partially reduced oxygen tension. Meningococci were not recovered from any of the cultures.

The spleen weighed 274 grams. The histopathology was consistent with splenic anemia of the Banti's type. The salient features were: diffuse fibrosis. hemorrhages in the marginal zones of the Malpighian corpuscles, thickening of the arterial walls, hyperplasia of the splenic nodules and hematopoiesis. The chief pathological changes were just outside of the Malpighian corpuscles. There were no vacuolated large mononuclear phagocytes such as are seen in Gaucher's or Pick-Niemann's disease. There was no evidence of leukemia or lymphoma. No organisms were seen and there was no evidence of acute inflammation. There were no tubercules or infarcts.

The patient made an uneventful recovery from operation. When last seen in the follow-up clinic she was enjoying good health. There was no appreciable change in the size of the liver.

It is impossible to say whether the chronic meningococcus sepsis was an initiating factor in the Banti's disease syndrome. It is quite possible that the splenic anemia was present before the meningococcemia. We have no information regarding the presence or absence of splenomegaly prior to the patient's admission with chronic meningococcemia. At least the association of the two conditions in this patient is unique.

SUMMARY

The literature on chronic meningococcemia is reviewed and discussed.

A case is reported, occurring in a child 8-9/12 years old, who made an excellent recovery following the administration of anti-meningococcus serum intravenously.

In this case chronic meningococcus sepsis was associated with splenic anemia of the Banti's type.

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THE DIAGNOSIS OF EXTRAUTERINE PREGNANCY*

With a Note on the Significance of Jaundice and Hyperbilirubinemia

BY JOHN JOSEPH DUMPHY, M. D.,† AND JOHN FALLON, M.D.†

EXTRAUTERINE pregnancy is of even greater interest to the general practitioner and internist than to the gynecologist and surgeon because the former will be more often called upon to make the diagnosis, and especially to make it early. Patients with extrauterine pregnancy frequently present themselves for vague or diffuse abdominal pain or for weakness. Most of our patients did not suspect pregnancy. The symptoms may even simulate appendicitis or gall-bladder disease as well as pelvic inflammation or miscarriage. However, the pessimism which formerly attended differentiation of this condition has disappeared and the diagnosis can be, and is, made early and correctly in upwards of eighty per cent. of the cases—comparing favorably to the accuracy of diagnosis in any abdominal disease.

Our series of forty-two consecutive cases from 1923 to 1930 is presented in an endeavor to weigh the value of several early symptoms and, more particularly, to emphasize the value of a symptom not usually stressed, that is, jaundice or hyperbilirubinemia, which occurs frequently enough to be an aid in diagnosis.

The history gives the diagnosis in most instances; few of our patients had pelvic examinations. They were purposely avoided from fear of starting or aggravating hemorrhage.

The classical symptoms are well known; the missed period, sudden pain, scanty flow, weakness, fainting, pallor and the evidence of internal hemorrhage and also the concomitants of pregnancy. However, they are rarely all present or in orderly sequence in the same patient. Even when present, they may not be discovered without careful search. Furthermore, it may be emphasized that no one of these symptoms is so constant that it is essential for diagnosis.

It is important that the history start with the symptom appearing first chronologically and this may not at all be the symptom for which the woman presents herself for examination. The initial symptom in our series was pain in thirty-two cases, and abnormal uterine bleeding in ten. The pain was described as acute or sharp in thirty cases and as aching in two. The bleeding was described as scanty in eight and profuse in two. Coincident with, or immediately following, the onset of sharp pain there was uterine bleeding in ten cases, faintness in six and vomiting in one.

The duration of symptoms at the time of examination varied from a few hours to four months—a duration of one day or less in six patients; one week or less in seven, one to two weeks in eight, two to four weeks in nine, one month or more in twelve.

Amenorrhea was present in all but five cases; however, only twenty-six of these thirty-seven patients realized that they had gone overtime in menstruation. Eleven considered that they had a normal period within four weeks but, upon questioning, the supposed normal period was found to be late, and usually differed in amount and type of flow. These eleven were all patients who had no previous irregularity. Hence, of the thirty patients who gave pain as the initial symptom eleven should, more correctly, have given abnormal uterine bleeding.

Abnormal uterine bleeding occurred some time during the history of thirty-two of these forty-two patients and was entirely absent in ten. The duration was from a few hours to four months. It was continuous in twenty-one and intermittent in ten. It was described as scanty in twelve, moderate in fourteen and profuse in five.

Evidence of internal hemorrhage. Fainting (14) or faintness (22) occurred thirty-six times; and this symptom is most helpful in diagnosis. Frequently the faintness was quite transient and recalled only by questioning. The patient will remember that when she got up to walk, or when seized by pain, she felt weak, dizzy, wobbly or sweaty and had to catch hold of something. Usually the patient can distinguish that the faintness was from weakness rather than from the severity of the pain.

Nausea was not a helpful symptom. Rectal or bladder pressure was diagnostic when present.

Previous menstruation was regular in two-thirds and irregular in one-third of the patients. Menorrhagia had been present in three. Six had dysmenorrhea. History suggesting previous pelvic inflammation was given in one-fourth and absent in three-fourths of the cases. One-fourth of the patients had had previous abdominal operations, of which two were for extrauterine pregnancy. One patient had had both tubes clamped and ligated.

On physical examination forty patients showed abdominal tenderness of varying degree. In seventeen the tenderness was diffuse over the lower or the whole abdomen. In two cases it was in the upper abdomen. Abdominal distention was noted in seven cases, rigidity in eight and tumor or induration in twelve. Pallor was observed in twenty-six cases and is one of the most characteristic and helpful findings. Five patients were considered to be

*Read at a meeting of the Webster Medical Club and Wachusett Medical Improvement Society, Webster, Mass., February 25, 1931.

†Dumphy—Physician, Fallon Clinic and St. Vincent Hospital, Worcester. Fallon—Surgeon, Fallon Clinic and St. Vincent Hospital, Worcester. For records and addresses of authors see "This Week's Issue", page 549.

in shock. Cyanosis was observed twice and air-hunger once. Colostrum in the breast was observed three times but was not consistently sought. Cullen's sign (blue discoloration of the umbilicus) was seen twice.

sign and that in the decision of a doubtful case it is a diagnostic finding when present.

Laboratory evidence of anemia (r.b.c. 1.8 to 4.2) was found in twenty-five of the forty-two cases, which closely parallels the observation of

TABLE 1

Forty-two cases, agus 20 to 42.

Previous Pregnancies
- None....12
- One....12
- Two....7
- Three....6
- Four....1
- Five....1
- Six....2
- Eight....1

Duration of Symptoms (at time of examination).
- One day or less....6
- One week or less....7
- One to two weeks....8
- Two to four weeks....9
- One to four months....12

Previous Menstrual History
- Regular....27
- Irregular....14
- Dysmenorrhea....6
- Menorrhagia....3

History suggesting previous Pelvic Inflammation.
- Present....11
- Absent....31

Previous Operations
- Appendix....4
- Extrauterine....2
- D. & C....2
- Gall-bladder....1
- Pelvic Abscess....1
- Kidney Stone....1
- Cesarean....1
  (both tubes clamped and ligated).

History.

Onset
- Sharp pain....30
  - Sudden sharp pain....13
  - Sharp pain and bleeding..10
  - Sharp pain and fainting.. 6
  - Sharp pain and vomiting.. 1

Scanty Uterine Bleeding....8

Aching Pain....2

Profuse Uterine Bleeding....2

History.

Amenorrhea....37
(2 to 84 days).

No Amenorrhea....5

Abnormal Uterine Bleeding....32
(few hours to 4 months).

No Abnormal Uterine Bleeding....10

Faintness....22

Fainting....14

Physical Examination.

Abdominal Tenderness....40
- Whole lower abdomen....13
- Left lower quadrant (chiefly or entirely)....11
- Right lower quadrant (chiefly or entirely)....10
- Whole abdomen....4
- Left upper quadrant....1
- Right costal margin....1

Abdominal tumor or induration....12
Abdominal rigidity....8
Abdominal distention....7
Pallor....26
Shock....5
Jaundice....5
Cyanosis....2
Air-hunger....1

Laboratory Findings.

Anemia....25
(r.b.c. 1.8 - 4.2 millions).

No anemia....10

Leucocytosis
- 14 to 36 thousand....17
- Below 14000....25

Serum Bilirubin recorded....12
- Increased (3-5 mgms)....8
- Normal....4

It is well known that jaundice may occur from intraperitoneal hemorrhage. One of our errors in diagnosis was made chiefly because of the presence and misinterpretation of jaundice. At operation it was evident that the jaundice was due to absorption of old blood (bile pigment). Afterward visible jaundice was observed in four cases of extrauterine pregnancy and in three cases of intra-abdominal hemorrhage from other causes. In twelve of our recent cases of extrauterine pregnancy the quantitative van den Bergh test was made and serum bilirubin well above normal was found in eight of these cases. We discovered that this was a very important

pallor (26) but not of faintness (36). In ten there was no anemia and in seven, red counts were not done. Leucocytosis from fourteen to thirty-six thousand was present in seventeen cases and in twenty-five the white count was below fourteen thousand.

The preoperative diagnosis was recorded in the last thirty-eight cases (1924-1930) and it was incorrect in eight. The accuracy of diagnosis has increased directly with the increase in the series of cases. In the last twenty-five cases (1927-1930) it has been correct in twenty-three and in the last seventeen cases (1929-1930) it has been correct in all. Of the eight errors in

preoperative diagnosis the incorrect diagnoses were pelvic inflammation four times, pelvic tumor, fibroid, acute pancreatitis and acute appendicitis. A careful review of the histories of these patients shows that sufficient characteristic symptoms were present to have made the correct diagnoses in six. In two of the cases (one diagnosed as acute appendicitis and one as fibroid) the histories would seem to warrant only those diagnoses.

During this time (1924-1930) operation was performed on two patients in whom the preoperative diagnosis of extrauterine was incorrect. In one there was nothing abnormal in the abdomen (miscarriage). The other had a ruptured chocolate cyst of the ovary.

Of the forty-two patients forty-one were operated upon and all of these recovered. One patient entered *in extremis* and died in the operating room before the operation could be started. Autopsy was performed on this patient. The left tube was found ruptured; 1800 c.c. of blood were bailed out of the peritoneal cavity and measured and 600-800 c.c. (estimated) were left in (the woman weighed 130 lbs.)—an unfortunate demonstration that fatal hemorrhage can occur from extrauterine pregnancy.

Ten of these patients were in serious condition and were poor operative risks. They were all operated upon promptly. Our procedure was to do nothing to raise the blood pressure before the bleeding was controlled. In all these cases transfusion of 500 c.c. or more of blood was given in the following manner:— Citrated blood was obtained and kept warm and in readiness. When the anesthesia (gas—ether) was started, the needle was introduced into the vein and 10% glucose solution was run in *very slowly* (200-400 c.c.). As soon as the incision was made and clamps applied, the blood was introduced. This procedure was varied only twice in patients who were so exsanguinated that it was thought imperative to give them blood before the anesthesia. It was one of these two that died before operation could be carried out.

TABLE 2

Operations	41
Right tube	27
Left tube	15
Fetus free in abdomen	3
Placenta adherent to uterus and broad ligament	1
Pelvic adhesions	8
Transfusions	10
Intravenous gum acacia	1
Autopsy (Patient died before operation).	1

CONCLUSIONS

Forty-two consecutive cases of extrauterine pregnancy were studied.

Forty-one patients were operated upon and recovered; one fatal hemorrhage occurred before operation (autopsy).

Sudden and sharp lower abdominal pain, abdominal tenderness, amenorrhea, abnormal uterine bleeding, evidence of internal hemorrhage (faintness, fainting, pallor, anemia) were the characteristic findings.

Onset with scanty uterine bleeding for a few days was frequently mistaken for a normal period.

Transient attacks of faintness may be overlooked.

Increased serum bilirubin or jaundice may occur and may be diagnostic.

Early diagnosis will make good surgical risks.

Poor surgical risks are helped by judicious transfusion.

EMBRYONAL CARCINOMA OF THE TESTIS— A THREE YEARS' CURE

BY SETH M. FITCHET, M.D.,* AND L. B. MORRISON, M.D.*

PERHAPS it was not an abnormal curiosity which led Mr. L, 38 years of age, to note a very small swelling on his right testicle, so small that on physical examination there was some uncertainty as to whether it was pathological or not. The curiosity together with the uncertainty led to an exploration two weeks later, at which time an orchidectomy was done.

This man had an entirely normal past history and was enjoying excellent health. He had never had pain or any other subjective symptoms and no other objective symptoms than the accidental finding of this "hard lump" on his right testicle, for which he was wise enough to wish an explanation.

Dr. Shields Warren supplied the accompanying photomicrograph and diagnosed the excised tissue as embryonal carcinoma of the testicle.

One of the accepted surgical procedures in such a case as this would have been to dissect the postperitoneal lymphatics which, on the right, lie on the connective tissue covering of the vena cava, and, on the left, on the connective tis-

*Fitchet—Assistant Surgeon, Children's Hospital. Morrison—Consultant Roentgenologist, Collis P. Huntington Memorial Hospital. For records and addresses of authors see "This Week's Issue", page 549.

sue covering of the aorta. It was decided, however, to do a simple but complete orchidectomy and follow this immediately with x-ray treatment, the first dose being given before he left the hospital.

In May, 1928, he was given local treatments over the scrotal area and over the mid abdomen in such a way as to cover the adjoining lymphatic vessels. He was given two-thirds of an erythema dose using 5 m. amp., tube distance sixteen inches, ¼ m.m. of copper filter, 1 m.m. of aluminum filter and 180,000 K.V. This treatment was followed subsequently with a like dosage on June 19, 1928, November 19, 1928, December 11, 1928, February 27, 1929, and May 8, 1929.

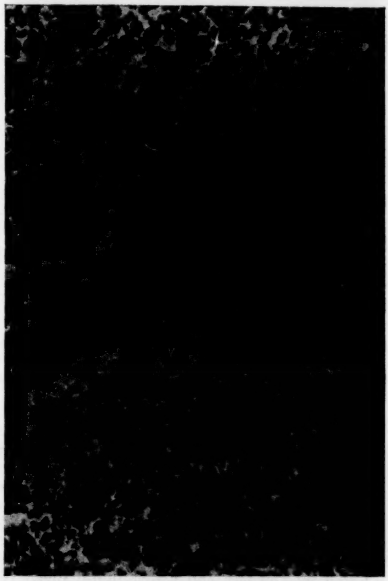
Dr. Nathaniel R. Mason informs me that he delivered this man's wife of a fine baby boy in December, 1930.

The patient has been followed carefully since his operation in April, 1928. He has had frequent x-ray examinations to try and find any evidence of metastasis. I have seen him at least every six months. It is now more than three years since his orchidectomy, and meticulous examination fails to show any evidence of local recurrence or metastasis. He enjoys his usual excellent health.

This case is reported

1. because of the relatively rare history of a three years' cure;

2. because it illustrates again the fact that certain embryonal tumors are responsive to x-ray therapy (if we are permitted to assume that the lymphatics were probably involved);



3. because the therapeutic procedures on this man did not make him impotent; and

4. because a little normal or abnormal curiosity regarding an "insignificant" lump probably saved his life.

TYPHOID FEVER

The marked reduction in the prevalence of typhoid fever throughout the United States has been one of the outstanding accomplishments in public health during the past quarter of a century. This has been accomplished in cities whose sources of public water supply are grossly polluted, largely by the intelligent installation of approved water purification plants. However, although the purified public drinking water meets the accepted sanitary standards, there often persists in such cities a small number of cases of typhoid fever. This fact stimulated the United States Public Health Service to undertake an extensive study of these persisting or residual cases of typhoid fever; the object being to determine if they could bear any relation to the municipal drinking water, even though it did meet the present rigid sanitary standards.

Six cities situated on the Ohio River were selected for study, both because of the polluted character of their raw water supplies and because of the excellence of their municipal water purification plants.

The Ohio River is the source of the public water supply for each city. During the period of raw water consumption, the typhoid fever incidence in each city was uniformly very high in every month of the year—a seasonal distribution which is typical of endemic water-borne typhoid fever. Following the installation of the present public water supplies, the typhoid incidence promptly fell to a low rate comparable with rates prevailing in other cities on the Ohio River watershed which have had, at least since 1914, safe water supplies. At the same time, the seasonal distribution changed so as to give a definitely Summer and Fall disease.

Ample evidence did accumulate to indicate that routes of transmission of typhoid fever other than the public water supply were in all probability the more usual. Therefore, the conclusion was reached from the evidence collected that modern water purification plants, such as are in operation in the six cities studied, when properly operated and controlled, effectively eliminate the danger of contracting typhoid fever from the public drinking water even though the raw water supply be grossly polluted.—*United States Public Health Service.*

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

TWO CASES OF UPPER ABDOMINAL SYMPTOMS WITH PELVIC TUMORS

SURGICAL DEPARTMENT

PRESENTATION OF CASES

CASE 17371

DR. GILBERT T. HYATT*: This is the case of a forty-five year old American housewife who entered the hospital complaining of abdominal pain and swelling.

About four months before entry she noticed a slight gnawing feeling in the right epigastrium four or five times daily, persisting for about ten days. At entry she still complained of it. Three months before entry she had a severe localized steady pain in the left upper quadrant following the ingestion of food, followed two or three hours after meals by the vomiting of coffee-grounds material. This pain was partially relieved by powders and a soft liquid diet. She had been eating four times a day, with nausea and vomiting at least twice a day ever since this, and had also had frequent eructations of gas. Her appetite was good. In the month and a half before entry she had intermittent sharp pain in the right lower quadrant radiating to the groin. Since that time her right side had been very tender, and painful enough to prevent her lying on it. Ten days before entry the right lower quadrant pain became more intense and she first noticed enlargement of the abdomen, which had since increased rapidly in size. She had been constipated for twenty-two years. On two occasions three months before admission she noticed tarry stools, and occasionally she had noticed specks of bright red blood in her stools. There was no jaundice and there were no clay-colored stools. Ten days before admission she noticed marked tenesmus. Her periods had been irregular since the onset of the illness. She missed the October period. She had had severe dysmenorrhea for the last three periods. She had some dyspnea and palpitation three weeks before entry. She had lost twenty-three pounds in the three months before entry.

In 1926 she first had pain and discomfort immediately after meals. In 1928 a diagnosis of ulcer was made by her own medical man. No x-rays were taken. Her symptoms were entirely relieved by a bland diet and powders. She was symptom-free until four months before entry.

*Recently senior interne on the West Surgical service.

She had been married twenty-two years and had four children living and well. Her husband was said to be a psychoneurotic.

On clinical examination she was a fairly well developed and well nourished, rather pale woman of forty-five lying comfortably in bed. Her teeth were dirty and carious. There was a questionable diastolic murmur at the apex. The abdomen was symmetrically enlarged to the size of an eight months' pregnancy. There was a soft smooth tumor from the symphysis to a handsbreadth above the umbilicus. There was tympany in both flanks and above the tumor and dullness over the tumor. A definite fluid wave could be felt in the tumor. There were some dilated veins over the lower abdomen. Pelvic examination showed a fixed cervix and a soft fluctuant bulging mass in the anterior cul-de-sac. High on the left side there was a hard, irregular, slightly tender mass in the posterior cul-de-sac.

The white blood cell count was 11,600, the red cell count 3,000,000, the hemoglobin 50 per cent. The smear showed 92 per cent polynuclears, 8 per cent lymphocytes, marked achromia. The platelets seemed increased. The sedimentation rate was 22, 46, 57, 59. The urine showed a very slight trace of albumin and one or two white cells per field.

The impression at this time was of a malignant ovarian cyst with pelvic metastases.

She was operated upon five days after admission and a large ovarian cyst was removed, as well as the uterus, both tubes and the other ovary. Some small hard nodules in the pelvis were left. Exploration revealed a large tumor mass involving most of the stomach.

The patient did fairly well for five days after the operation, then began to vomit and to have epigastric distress. The non-protein nitrogen was 125; three days later it was 150. She went downhill fairly rapidly and died eleven days after operation.

CASE 17372

DR. JOE VINCENT MEIGS: Recently in a neighboring town I saw a patient who complained of lower abdominal pain and severe constipation. She had had no loss of appetite, no gastric troubles of any kind, but she had noticed masses in her lower abdomen and had terrific constipation.

She was a well nourished woman of fifty-five who had passed the menopause three years. There was no recurrent bleeding from the genital tract. She had a large lower abdominal tumor which ran from the liver region down the right side. It was movable and had an edge that could be felt above and below. It was apparently not a tumor of the liver or kidney. The mass felt more like a tumor of the spleen. In the left lower quadrant, and not connected with the first mass, was a rounded mass. Va-

ginal examination showed that it extended from the left side down into the pelvis. This was thought to be an ovarian cyst.

At operation the abdomen was found to contain a small amount of clear fluid. The right ovary was a lobulated smooth whitish mass, solid except for one or two pronounced cystic areas which seemed quite localized. There were no papillary growths and no adhesions. The left ovary consisted of a kidney-shaped mass of tissue. It was also freely movable and showed no adhesions and no papillary growths anywhere. A diagnosis of Krukenberg tumor was made. There was a carcinoma of the stomach about 8 centimeters in length and 4 centimeters in diameter on the lesser curvature. The two ovarian tumors were removed, but not the uterus, as her condition would not allow any more surgery.

In 1896 Friedrich Ernst Krukenberg described tumors of the ovary such as these and called them fibrosarcoma-mucocellulare. He felt that they were sarcomas. They are characterized by a connective tissue stroma containing cells full of mucus, the so-called signet ring cells. He did not attach any significance to these cells. He considered the tumors as primary ovarian tumors. It was not until much later that Schlagenhaufer found that these tumors are practically always secondary to cancer in the gastro-intestinal tract or the bile ducts. The cysts in these tumors are usually solitary or very few. The cystic areas probably originate in atretic follicles with many signet ring cells.

In contrast to these two tumors are the ones which Dr. Linton removed from patient 17372. His patient had general peritonitis at one time. It is quite possible that that made a change in the appearance of the tumors, as you see, causing adhesions. Usually they are without adhesions.

Case 17371

Clinical Diagnoses (From Hospital Record)

Malignant ovarian cyst with abdominal carcinomatosis.
Uremia.
Carcinoma of the stomach.

Anatomic Diagnoses

Carcinoma of the stomach with retroperitoneal and ovarian metastases.
Central necrosis of the liver.
Leiomyoma of the uterus.

Case 17372

Diagnosis

Krukenberg's tumor of the ovaries.

Pathologic Discussion

Dr. Bradley: We have the autopsy findings on the first two cases. In Case 17371 the stomach showed near the pylorus on the lesser curvature a large firm mass completely surrounding the pylorus, causing an obstruction barely admitting the little finger. One ovary was represented by a large cystic mass 11 centimeters in diameter with a thick wall averaging 1.5 centimeters in thickness, and the other was represented by a smaller irregular mass of soft whitish tissue. They were described as bilateral tumors of the ovary, the gross appearance of which suggested that they were malignant. The liver measured 67 centimeters in diameter. The mesenteric and retroperitoneal glands were enlarged.

In Case 999, another recent case of Krukenberg's tumor, although on palpation the wall of the stomach felt thickened, a definite mass could not with certainty be made out. Yet when the stomach was removed we found a large neoplastic lesion involving the major portion of the stomach, centering along the lesser curvature and extending from within 3 centimeters of the esophageal orifice to within 3 centimeters of the pylorus. On section it was a solid tumor, fairly homogeneous, with scattered areas of necrosis. The mesenteric glands were somewhat enlarged. The retroperitoneal glands were slightly enlarged. There was an area of very dense infiltration of the mesentery of the terminal ileum and of the adjacent portion of the bowel. There was definite diminution of the intestinal lumen there.

These are the specimens from the case described by Dr. Meigs, kidney-shaped tumors with smooth surface and showing on section a homogeneous, almost translucent, very watery surface. The tumor shows microscopically numerous scattered small clumps of cells separated by a relatively very abundant and very loose and edematous stroma. There are clumps of relatively large rounded cells, showing in most instances a single large vacuole having the staining characteristics of mucin and with the nucleus eccentrically displaced, giving the appearance of a signet ring.

The tumor in Case 17371 is made up of a structurally undifferentiated mass of polyhedral and spindle-shaped cells giving the tumor the appearance of fibrosarcoma in some areas and of carcinoma in others. Very rare signet ring cells are seen. One area shows definite gland formation. The stomach in this same case shows a very diffuse infiltration of tumor cells throughout the entire wall. Those cells are similar to the occasional vacuolated cell found in the ovarian tumor.

This is a section of the ovarian tumor from Case 999, resembling more the one in Case 17371 just presented than that in Case 17372. In this case there is a rather striking infiltration of tumor in both the tubes.

Dr. Harry F. Hartwell: The first time this Krukenberg's tumor was brought to our atten-

tion was about ten years ago, when Dr. Richardson operated on a bilateral tumor similar to the one in Case 999. They were large kidney-shaped tumors, solid, without any cysts. It was thought at that time that they were sarcomas. This patient came into the hospital again about eight months afterwards and was autopsied. Primary cancer in the stomach was found, and comparing the slides of the ovarian tumors and the cancer of the stomach, they had the same structural appearances. The cells were arranged in small clusters and contained large vacuoles, making the so-called seal ring type of cell.

DR. BRADLEY: These are specimens of the case of which Dr. Hartwell has just spoken. Again the tumor preserves quite well the normal shape, having a kidney-shaped outline resembling quite closely these other specimens. Histologically these tumors, which correspond to Krukenberg's original description, show a quite similar picture differing from the other solid tumors we have shown. This one shows numerous well-formed vacuolated signet ring cells.

We have one other case, a case Dr. Vincent will recall, the specimen from which I have here. The patient had bilateral ovarian tumors and carcinoma of the rectum. The bilateral ovarian tumors were removed at the first stage of operation and the carcinoma of the rectum was successfully removed at a second operation.

DR. BETH VINCENT: Is the ovarian tumor secondary to the rectal cancer?

DR. BRADLEY: I am quite sure it is. Histologically the tumor of the ovary is very much like the tumor of the large bowel and I feel that there is no reasonable doubt about its identity.

This is a section of the ovarian tumor in this last case. You see the large irregular glands lined by cylindrical epithelium. Here is a section of the tumor in the rectum. They seem quite similar.

A PHYSICIAN: Was the stomach examined in that case?

DR. BRADLEY: The patient, according to the latest follow-up report, is still living.

DR. FULLER ALBRIGHT: Are you sure the tumor of the rectum was not metastatic?

DR. HARTWELL: The cells are different from the seal ring type of cell we get in these Krukenberg's tumors.

DR. BRADLEY: In gross the specimen of the tumor in the rectum was typical of a primary carcinoma. It was a quite sharply localized rounded lesion and the greatest portion of the tumor was on the mucosal surface, quite a different picture from a secondary tumor.

DR. VINCENT: We knew she had cancer of the rectum months before the tumor appeared in the abdomen. She was in medical hands from the first, but refused operation for the cancer of the rectum. When she came in some months later the abdominal tumors had developed. Operation proved that it was bilateral ovarian tumor. Clinically we could see that the cancer of the rectum was primary to the ovarian tumor.

DR. MEIGS: There are four true Krukenberg tumors that have been operated upon in this hospital. In some the stomach cancer has been found first and later the ovarian metastases, while in others the ovarian tumors have been removed only to have the patient return with hopeless carcinoma of the stomach. The rectum and sigmoid have also been the original foci of metastatic ovarian cancer of the gastro-intestinal tract type.

The metastasis is usually accomplished without any abdominal implantation. It is probably lymphatic in origin, although a retrograde extension is necessary. Lack of adhesions and lack of papillary outgrowths are characteristic of true Krukenberg tumors.

DR. ALBRIGHT: There is one more case which we have had here which is also listed under Krukenberg's tumor.

DR. MEIGS: Do you know that it was operated upon and proved?

DR. ALBRIGHT: Bilateral tumors of the ovaries were found at operation and a carcinoma of the stomach was later demonstrated by x-ray.

DR. MEIGS: It must be looked up.

DR. ROBERT R. LINTON: I think the thing I have learned is that any case of bilateral ovarian tumor certainly ought to have a careful gastric study before being operated upon.

The New England
Journal of Medicine

SUCCESSOR TO
THE BOSTON MEDICAL AND SURGICAL JOURNAL

Established in 1828

Published by THE MASSACHUSETTS MEDICAL SOCIETY under the jurisdiction of the

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SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States, Canada $7.04 per year, $7.56 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 165 Newbury Street.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The New England Journal of Medicine, 165 Newbury Street, Boston, Mass.

ANTERIOR POLIOMYELITIS

NEWSPAPER reports are daily bringing to public attention the fact that the entire northeastern section of the United States is experiencing a widespread and extensive epidemic of poliomyelitis. It is, of course, too early to draw definite conclusions but every indication suggests that this will be the biggest wave since 1916. As in that year, New York City is being most seriously affected.

The wave began in New York City during the latter half of July and increased rapidly to a peak during the week of August 8. Since then, there have been signs of considerable decline, though it is too early to see whether this marked decline will be maintained. The increase in Massachusetts began some three weeks later and has been much more gradual. It has not, however, shown any signs of having reached its peak, although at no time has it assumed the proportions of the epidemic in New York City and Connecticut.

Last year there were some 500 cases in the State, which was with two exceptions the highest year since 1916. The major portion of these were in the Metropolitan Area and along the North Shore. It was reasonable to expect, therefore, that these areas would, if infantile paralysis arrived, be less seriously affected this year than other sections of the State. Experience so far has borne out this contention and, although many cases of the disease have appeared, they have not been unduly prevalent considering the concentration of population in this area.

The western half of the State, which has since 1916 been relatively free of the disease, has been most seriously affected. Holyoke in particular has felt its presence and from that as a focus it has spread into adjoining communities. Another focus has appeared in Franklin County centering around Greenfield. The Berkshires likewise have had more than in recent years.

So far this year Worcester County has been relatively free, but there are signs that the disease is on the increase in that section. The southeastern corner has shown foci around Brockton, Fall River, New Bedford, and Wareham and, during the past two weeks, the disease has begun to show up on the Cape. In general, therefore, it can be said that it has appeared in all sections of the State, that it is most concentrated in the Connecticut Valley, and that the northeastern corner is being most spared.

The resources of the Harvard Infantile Paralysis Commission have been taxed to the limit and, through coöperation with the Department of Public Health, it has been necessary to expand them to greater proportions than ever before. Representatives of the Commission are, however, available to see cases with physicians in all sections of the State and have supplies of serum ready to administer to preparalytic cases of the disease. Owing to the number of cases which are to be seen, it has not been advisable to release supplies of the serum to private physicians, inasmuch as to do so would mean that serum could not be kept constantly available in those sections where the pressure was greatest. In the Connecticut Valley, representatives of the Commission have been stationed so as to speed up the service to those cases. In order to keep a steady supply of convalescent serum, the Department has taken over the responsibility for the collecting and processing, and is at present holding three clinics a week for the purpose of such collection. The response on the part of donors has been remarkable, many coming long distances to these clinics in order that they might make their contributions. Other states have, in some instances, found it necessary to pay for such contribution, but it has not been necessary in Massachu-

setts and donors have never asked for such remuneration.

As before, calls to the Commission are handled through the Infantile Paralysis Commission office, The Children's Hospital, or the Department of Public Health. Twenty-four hour service is available in the office of the Department so that at no hour of the day is it impossible to reach the Commission. In Holyoke, calls are being handled by Doctor Miner, the State District Health Officer, and the representatives of the Commission are working out from his home. For the moment a representative is stationed in Greenfield taking calls through the Contagious Disease Hospital. As other foci develop, it may be necessary to establish other centers or to transfer these centers as the case may be. It is, of course, not possible to keep all physicians in the area informed as to the location of each center, but all calls directed either to the Commission or the Department of Public Health will be referred to the nearest man available.

HEALTH ON THE FARM AND IN THE VILLAGE

It has been recognized for some time that a public health service has never been offered to the rural population of our country comparable with that given to the average tenement-dweller in a large city. Public health services, in the largest sense of the word, are now available in practically all cities of the United States with a population over 50,000 and these services have been highly organized through state officials and private charities. That a similar service can be given to the farmer and those who live in small villages is adequately demonstrated by an extensive survey of conditions in a certain county in New York state, a report of which has recently been published by the Professor of Public Health in the Yale Medical School*.

With the aid of the Milbank Memorial Fund of New York an investigation of rural public health and the methods for its improvement was begun in Cattaraugus County, New York, in 1923. The county is a typical rural district of the northeastern United States, containing a fairly stable and homogeneous population of about 72,000 persons, engaged chiefly in small industries and dairying. The region is relatively prosperous, the average per capita income being about $900. The Cattaraugus County program was launched with an organized full-time County Health Department, having bureaus dealing with communicable diseases, tuberculosis, and statistics, as well as a county laboratory service. Two years later, a nursing service was added, under a separate bureau, and an effort made to control venereal disease. The next year a Bureau of Maternity, Infancy and Child Hygiene was created, and in 1929, a trained sanitary engineer was appointed. This service, partly financed by the Milbank Fund, coöperated with the County Department of Health, the School Health Service, and the Tuberculosis and Public Health Associations.

An estimate, after eight years of the survey, is of considerable value in pointing out the probable course of rural public health and the effect which a demonstration of this type may have upon it. It is, perhaps, too early to note the entire effect of the health program and Dr. Winslow points out that a program as extensive as this one should be in effect for at least ten years before its value can be completely ascertained. Nevertheless, after eight years, definite results have been brought about, particularly in the sharp reduction of the mortality rates for diphtheria, tuberculosis, and diseases of infancy; and it is estimated there is an annual saving of at least five lives by reduction in diphtheria, of fourteen by reduction in tuberculosis, and of twenty by reduction in infant mortality, "an equivalent to a reduction in economic loss to the community of $300,000 a year—or nearly double the entire yearly cost of the health program".

A second result was the success of the demonstration in convincing the county authorities of the value of a modern health program and the importance of making financial sacrifices for the results effected by such a program. Alfred E. Smith, then Governor of New York, noted, in 1926, that the survey had resulted in promoting the physical welfare of the inhabitants to a remarkable degree. The cost of the program, however, was relatively high and this should be taken into account before other rural districts adopt similar policies. The cost was about $2.50 per capita per year and such an amount is only possible in a district where there is a high per capita annual income, with the people living at a very low economic level. It should be pointed out, moreover, that an adequate public health program of this type pays for itself twice over in its direct contribution to the vital resources of the community concerned and, therefore, it is good policy for a state to initiate such a program in any of its rural districts.

*Health on the Farm and in the Village: A Review and Evaluation of the Cattaraugus County Health Demonstration with Special Reference to its Lessons for Other Rural Areas, by C.-E. A. Winslow, Dr.P.H. New York: The Macmillan Co., 1931. vii + 281 pages. Price, $1.00.

LADY OSLER

To be the wife of a great man is, perhaps, the most exacting task any woman could choose. This is particularly true when the husband happens to be the world's best known physician, with strong bookish and social tendencies. "You are going to marry a man who has books all over the floor," someone said to Mrs. Gross, in 1892, before she married Dr. William Osler, but such a remark failed to upset a most unusual woman, to whom order was the supreme law and whose life, nevertheless, was not rendered mis-

erable by the vagaries of her husband. She well understood why the dining-room table could never be "cleared" and why he could "breakfast at five-o'clock tea and dine on the following day".

Although Osler's career is well known, especially since the publication of Cushing's "Life", little has been written to perpetuate the ephemeral details of Lady Osler's activities. One welcomes, therefore, a most delightful and sympathetic account of her by a former Oxford graduate, who fell under the spell of the Oslers' home just after the Great War*. Although not trained in either science or medicine, Mr. Muirhead caught the spirit of "The Open Arms", as the house was affectionately known, even after Osler's death. There he had the run of the Library, exactly as in Osler's day, and there he met Lady Osler, came under the influence of her gracious personality and realized that, as an example of selfless devotion and unflinching spirit, she deserved not to be known by posterity as simply "Osler's wife". His little book, which should be widely read by all lovers of Osler and all admirers of the Osler tradition, is a splendid brief memoir of "a much beloved woman".

*Grace Revere Osler: A Brief Memoir, by Arnold Muirhead. Oxford University Press, 1931. 56 pages.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

HAWES, JOHN B., 2ND. A.B., M.D. Harvard University Medical School 1903. President, Boston Tuberculosis Association. Director, Massachusetts Tuberculosis League and National Tuberculosis Association. His subject is: "A Historical Sketch of the Tuberculosis Section of the Massachusetts Medical Society." Page 517. Address: 11 Marlborough Street, Boston.

CHURCHILL, EDWARD D. B.S., A.M., M.D. Harvard University Medical School 1920. John Homans Professor of Surgery, Harvard Medical School. Chief of West Surgical Service, Massachusetts General Hospital. Consulting Surgeon, Rutland State Sanatorium. His subject is: "The Selection of the Operation for the Patient in Pulmonary Tuberculosis." Page 519. Address: Massachusetts General Hospital, Boston.

ZACKS, DAVID. M.D. Tufts College Medical School 1920. Supervisor of Clinics, Massachusetts State Department of Public Health. His subject is: "What We Have Learned in Massachusetts from the Ten-Year Program." Page 525. Address: State House, Boston.

DAVIS, WILLIAM E. B.S., M.D. Harvard University Medical School 1928. Formerly with the Department of Gastro-enterology, Lahey Clinic. His subject is: "The Incidence of Untoward Symptoms Following the Intravenous Injection of Sodium Tetraiodophenolphthalein in Cholecystography." Page 534. Address: Ellensburg, Washington.

BINNS, JAMES F. A.B., M.D. Vanderbilt University Medical School 1928. Assistant in Pediatrics, Harvard Medical School. Address: Children's Hospital, Boston. Associated with him is:

FOTHERGILL, LEROY D. A.B., M.D. Harvard University Medical School 1929. Assistant in Pediatrics and Bacteriology and Immunology, Harvard Medical School. Address: Children's Hospital, Boston. Their subject is: "Chronic Meningococcus Septicemia." Page 536.

DUMPHY, JOHN JOSEPH. A.B., M.D. Harvard University Medical School 1921. Physician, Fallon Clinic and St. Vincent Hospital, Worcester. Address: Slater Bldg., Worcester, Mass. Associated with him is:

FALLON, JOHN. A.B., M.D. Harvard University Medical School 1923. Surgeon, Fallon Clinic and St. Vincent Hospital, Worcester, Mass. Address: Slater Bldg., Worcester, Mass. Their subject is: "The Diagnosis of Extrauterine Pregnancy." Page 540.

FITCHET, SETH M. A.B., B.P.H., M.D. Harvard University Medical School 1921. F.A.C.S. Assistant Surgeon, Children's Hospital. Assistant Surgeon to Out-Patients, Massachusetts General Hospital. Address: 319 Longwood Avenue, Boston. Associated with him is:

MORRISON, L. B. M.D. University of Vermont College of Medicine 1902. Consultant Roentgenologist, Collis P. Huntington Memorial Hospital. Radiologist, New England Deaconess Hospital, New England Baptist Hospital, Robert Breck Brigham Hospital and The Faulkner Hospital. Address: 370 Marlborough Street, Boston. Their subject is: "Embryonal Carcinoma of the Testis—A Three Years' Cure." Page 542.

LEWIS, W. H., JR. A.B., M.D. Harvard University Medical School 1926. Resident Pathologist, Palmer Memorial Hospital 1928-1929. Resident in Pathology, Huntington Memorial Hospital. Assistant Pathologist, Pondville Hospital. Assistant in Pathology, Harvard 1929-1930. His subject is: "Cancer Clinics and Radium Therapy in Paris." Page 550. Address: Donora, Pennsylvania.

IMPORTANT NOTICE

ON and after September 23 the offices of the *New England Journal of Medicine* and the Massachusetts Medical Society will be in their permanent quarters at the Boston Medical Library, 8 The Fenway. The telephone number will remain the same, Kenmore 2094.

Please make a note of this change in order to avoid confusion.

CANCER CLINICS AND RADIUM THERAPY IN PARIS*

BY WILLIAM H. LEWIS, JR., M.D.†

In Paris the facilities for the care and treatment of cancer are chiefly at the Institut du Radium, the hospital Hotel Dieu, and the Institut du Cancer, the last in Villejuif, just outside the city. Clinics are also held and radium therapy given at the hospitals Tenon, Salpetrière, Saint-Antoine, Necker, Lariboisière.

INSTITUT DU RADIUM — FONDATION CURIE

This institute, on the rue Pierre Curie, is the largest center in Europe for the investigation of the properties of radium and its therapeutic application. Established in 1911 it did not begin active operation until 1919. It is divided into two departments:

1. the laboratory for the study of the physical properties of radium and the physico-chemical nature of radio-active bodies, under the administration of the Faculty of Sciences of the University of Paris and directed by Madame Curie;
2. the laboratory for the study of radio-physiology and the biological effects of radiation, under the administration of the Institut Pasteur and directed by Professor Regaud.

As part of and adjoined to the Institut are the laboratories and facilities of the Fondation Curie for the therapeutic application of radiations, particularly in malignant disease. Its hospital arrangements are nearby in the Hôpital Pasteur, rue de Vaurigard; also for patients able to pay, there is a service in a private hospital, rue Antoine Chantin. Assistants and médècines stagiares are admitted to the various departments for investigative work for a period of at least 6 to 12 months.

The staff at the Fondation Curie consists of full-time radiologists and of two half-time surgeons. Out-patient clinics are held on Tuesday and Thursday afternoons by several members of the staff; a conjoint opinion on diagnosis and treatment is obtained. The clinics for the new patients are conducted primarily by the surgeons, with the assistance of the radiologists. The surgical work consists mostly of block dissections of the glands of the neck. A biopsy specimen is obtained on all cases when possible. The pathology department makes no formal grading of tumor activity, but does consider variations in degree of malignancy by description on microscopic examination.

Radium Therapy at Fondation Curie. The Fondation at present has 7½ grammes of radium at its disposal, the largest body in one institution in Europe. Its x-ray plant of modern type provides a peak voltage of 220 kilovolts and treatment for 8 patients at one time.

The chief features of the radium therapy are:

1. radium as element or radon used entirely for lesions of skin, lip, tongue, mouth, throat, and cervix. Also used for lesions elsewhere for palliative effects.
2. platinum filtration, usually 0.5 mm. thickness for interstitial work and 1.0 mm. for surface therapy.
3. single effective treatment with a moderate amount of radium over a moderately long period of time.
4. numerous foci of distribution of radiation.
5. combined radiation, consisting of internal radium application followed by external radium "bomb" or deep x-ray therapy—over the neck in lesions of lip, tongue, and throat with cervical gland metastases, and over the abdomen in lesions of cervix.
6. careful recording of site of lesion and of treatment with use of diagrammatic sketches. For later reference, if cure is not obtained, to distinguish between recurrence and persistence of original lesion because of insufficient treatment.
7. duration of time for consideration of cure, five years.

Carcinoma of the skin and lip are treated either with radon or radium element contained in platinum needles. The dosage is estimated for the totality of millicuries destroyed per sq. cm. and usually is based on 200 to 265 millicurie hours per sq. cm. The duration of treatment is 5 to 6 days. The application of radiation to a position over the lesion is effected by imbedding the needles in a holder made of a beeswax substance, Columbia paste. The holder can be molded to fit the body part and held in place by a bandage so that the patient can be at home during treatment. The holder of each individual patient is preserved, and a record of dosage and position of separate needles filed to be checked with the imprints in the paste; in case of persistence of the tumor, a review of the holder gives information for determining the question of recurrence or of insufficient treatment, e.g., of a marginal focus.

Carcinoma of the tongue is treated by platinum needles directly inserted in the tumor; they have equal strength of radiation, but vary in number according to the size of the tumor. The total dosage varies from 1065 to 4000 millicurie hours, applied over 4 to 5 days. Carcinoma of the larynx, pyriform fossa, and inaccessible pharyngeal spaces are treated by deep x-ray therapy with heavy filtration and high voltage.

*Dr. B. W. Windeyer, Radiologist to the Middlesex Hospital, London, kindly reviewed these notes.

†Lewis—Resident in Pathology, Huntington Memorial Hospital. For record and address of author see "This Week's Issue", page 549.

Treatment of carcinoma of the cervix is effected by cross radiation from one set of 3 platinum needles placed in the uterine fundus and a second set placed in the vagina about the cervix. The total dosage, given over 5 or 6 days, usually is 7980 millicurie hours. The fundus set is inserted in a stem gum bougie, the vaginal set is mounted on a colpostat consisting of a spring and three corks. It is considered that such an arrangement of the radiation assures maximum concentration on the cervix and additional effect on adjacent structures, especially the broad ligaments. It is customary to give additional radiation over the lower abdomen externally by deep x-ray or preferably by a radium "bomb" of 4 grammes of element. The area for external radiation is divided into fields; each field receives the optimum epidermicidal dose.

The treatment of choice for carcinoma of the breast is operation. In inoperable and recurrent cases, radiation is utilized, either by surface and interstitial application of element (or radon) or by external "bomb" treatment, or by both; also, x-ray therapy may be utilized.

HOTEL DIEU

The cancer clinic is under the direction of Professor Henri Hartmann, formerly chief surgeon until his retirement in 1930. He has 2 wards of 60 to 80 beds for cancer cases, conducts an ambulatory clinic on Monday afternoons and a surgical clinic on Tuesday or Wednesday mornings. Hartmann has experience in the use of both radium and surgery. He has 700 to 800 milligrams of radium element at his disposal, applied with platinum filtration. He utilizes radium mostly for lesions of the skin and mouth; wholly for lesions of the cervix, treatment of which covers 5 or 6 days.

For treatment in cervical cases of the abundant discharge from infection of necrotic tissue, he is trying local vaccine therapy. The vaccine is an auto-bouillon mixture, prepared from the vaginal flora. Ten c.cm. are tamponed in the vagina after the insertion of the radium. Before the treatment, and during the preparation of the autogenous vaccine, a stock vaccine is used. There follow early drying-up of the discharge, disappearance of the abundant vaginal flora, and rapid cicatrization within 4 to 6 weeks.

INSTITUT DU CANCER

This institute is the focus point of the national cancer campaign, as well as the receiving unit for Paris and its environs. It is directed by Gustave Roussy, Professor of Pathological Anatomy in the Ecole de Médècine. It is associated with the hospice for the aged in Villejuif. Its new buildings, now in process of completion, will contain 120 beds for treatment and permanent care of cancer patients. At present there are 50 beds utilized in the hospice. There is a large, new, and well-equipped pathological institute, which will provide facilities for various types of investigation. The clinics at the hospital are held on Saturday mornings by the director and staff. Biopsy specimens are taken when possible; the microscopic slides are fitted into and made part of the patient's record sheet. The institute has at its disposal about 1½ grammes of radium; treatment is by element with filtration by platinum. Surgical facilities are also present.

NATIONAL CANCER CAMPAIGN

The campaign in France was promulgated in 1921 and the program elaborated in 1925. It is also directed by Roussy. As present constituted, it consists of the establishment of cancer clinics in the principal cities of France, staffed by a group of local physicians. A committee of local citizens coöperates in the publicity campaign. The functions of the clinics are primarily diagnostic; what therapeutic work is done is mainly surgical since the supply of radium of France is mostly concentrated in Paris.

MISCELLANY

MORTALITY RATES

Telegraphic returns from 82 cities with a total population of 36 million for the week ending August 22, as reported by the *United States Daily*, indicate a mortality rate of 10.1 as against a rate of 9.5 for the corresponding week of last year. The highest rate (16.9) appears for Atlanta, Ga., and the lowest (4.4) for Tacoma, Wash. The highest infant mortality rate (15.1) appears for Waterbury, Conn., and the lowest for Des Moines, Iowa; Long Beach, Calif.; Lynn, Mass.; Peoria, Ill.; Springfield, Mass., and Tacoma, Wash., which reported no infant mortality.

The annual rate for 82 cities is 12.4 for the 34 weeks of 1931, as against a rate of 12.3 for the corresponding weeks of 1930.—*Issued by the Bureau of the Census.*

OPERATION OF THE STANDARD MILK ORDINANCE IN MISSOURI

As a part of the program of research in the field of public health, the United States Public Health Service has for several years advocated a standard milk ordinance for the protection of municipal milk supplies. The results of the operation of the standard milk ordinance in Missouri at the close of 1930 contain several items of interest, according to a communication from the Service.

There were 19 cities in the State of Missouri having a population of 315,127, operating under the standard milk ordinance. The sanitary quality of the retail raw milk in these cities has improved 54 per cent. The sanitary quality of the raw milk delivered to the pasteurization plants has improved 90

per cent. The pasteurization plants themselves have improved 60 per cent. There has been a material increase in the consumption of pasteurized milk. Two cities now have over 50 per cent. of their milk supply pasteurized, and two others have between 40 and 50 per cent. Pasteurized milk sales have increased 108 per cent. The consumption of market milk has increased 18 per cent. The per capita consumption of milk in 17 of the 19 cities in Missouri is .74 of a pint per day.

COMPARISON OF DISEASE INCIDENCE IN CONNECTICUT WITH 1930 AND SEVEN YEAR AVERAGE

MONTH ENDING AUGUST 15, 1931

	1931					1930			
Diseases	Week ending July 25	Week ending Aug. 1	Week ending Aug. 8	Week ending Aug. 15	Average cases reported for week corresponding to Aug. 15 for past seven years	Week ending July 26	Week ending Aug. 2	Week ending Aug. 9	Week ending Aug. 16
Cerebrospinal Men.	—	—	2	—	1	2	2	—	—
Chicken Pox	12	12	9	14	6	9	12	2	4
Diphtheria	9	8	2	13	13	6	4	5	4
Dysentery Bacillary	1	—	—	—	—	—	—	—	—
Encephalitis Epid.	2	1	—	3	—	—	—	—	—
German Measles	3	1	2	1	1	3	2	3	2
Influenza	—	2	2	1	2	—	1	—	—
Malaria	1	—	—	—	—	—	1	—	1
Measles	55	28	34	23	12	8	10	8	11
Mumps	20	5	28	11	6	7	8	4	8
Paratyphoid Fever	—	—	2	1	—	—	—	—	—
Pneumonia (Broncho)*	6	8	5	12	5	8	10	4	5
Pneumonia (Lobar)	8	5	7	3	7	8	5	4	7
Poliomyelitis	11	37	97	67	5	4	1	—	1
Scarlet Fever	9	1	7	12	11	10	7	8	5
Septic Sore Throat	—	—	3	2	28	—	1	2	—
Trichinosis	—	—	—	—	—	—	2	1	—
Tuberculosis (Pul.)	48	23	13	21	29	17	32	10	28
Tuberculosis (O. F.)	6	1	—	1	4	4	2	1	4
Typhoid Fever	1	4	2	6	6	2	2	—	1
Whooping Cough	58	84	69	70	33	46	45	30	36
Gonorrhea	30	22	56	37	31	13	42	30	45
Syphilis	27	33	32	36	30	19	59	38	61

Remarks: No cases of Asiatic cholera, glanders, plague and yellow fever during the past seven years.

*Made reportable January 1, 1925.

HEALTH SERVICE METHODS BEING STUDIED BY FRANCE

Administrative methods of the United States Public Health Service, the *United States Daily* reports, are being studied by Dr. F. Bourguin, Chief of Documentation of the National Office of Social Hygiene at Paris. Dr. Bourguin is making the study in behalf of his organization in France. He will study also various public health organizations in states and municipalities, according to the statement.

NEW YORK ASKS INCREASE IN HOSPITAL BUDGET

With New York's twenty-six municipal hospitals running 25 per cent. above their capacity because of the increase in patients, the Department of Hospitals, through Dr. J. G. William Greff, has asked for an increase of $5,800,000 in the budget. According to his statement, a total of $25,326,385 is necessary for efficient operation next year.

PREVALENCE OF COMMUNICABLE DISEASES

The United States Public Health Service has issued the following statement regarding the prevalence of communicable diseases in the United States.

The 96 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 32,555,000. The estimated population of the 89 cities reporting deaths is more than 31,010,000.

The estimated expectancy is based on the experience of the last nine years, excluding epidemics. Weeks ended August 8, 1931, and August 9, 1930:

CASES REPORTED

	1931	1930	Est. exp.
Diphtheria:			
46 States	476	571	—
96 cities	201	230	389
Measles:			
45 States	1,238	1,109	—
96 cities	377	306	—
Meningococcus meningitis:			
46 States	72	94	—
96 cities	24	54	—
Poliomyelitis:			
46 States	1,029	253	—
Scarlet fever:			
46 States	812	621	—
96 cities	296	194	250
Smallpox:			
46 States	159	259	—
96 cities	20	17	16
Typhoid fever:			
46 States	999	980	—
96 cities	140	107	133

DEATHS REPORTED

Influenza and pneumonia:			
89 cities	300	324	—
Smallpox:			
89 cities	1	—	—
Minneapolis, Minn.	1	—	—

BIRTH CONTROL IN GERMANY

A few decades ago, according to the *New York Times*, the average number of children per German family was about four; today it is less than two. Forty per cent. of the post-war marriages are childless; 60 per cent. of the more recent marriages in Berlin. It is estimated that present ratios of births and deaths would bring Germany's population down to about 45,000,000 by the third quarter of this century. Few of Germany's problems are giving her statesmen more concern at present than this wave of birth control.

HIGHER DEATH RATES FROM CANCER AND HEART DISEASE

The cancer death rate, in the first six months of this year, increased considerably in 10 States reporting to the United States Public Health Service, according to the *United States Daily*.

Fatalities from this cause in the area reporting increased from 82.7 per 100,000 population in the first six months of 1930 to 86.1 in the corresponding period of this year, it was explained. Death from heart disease in these same States likewise in the comparative periods increased from 194.5 to 196.3 per 100,000 population, according to the statement. Additional information follows:

Figures reported by these 10 States may be considered only as general gauges for the situation in the country as a whole. Probably the only definite conclusion which may be reached from the figures is that both cancer and heart disease fatalities are becoming more numerous yearly. Other reports, however, issued by other statistical organizations, have shown larger increases in cancer fatality rates during the first six months of this year than do the figures of the Service.

The following figures will show the approximate increase in the cancer and the heart disease death rate during each year since 1923. Figures for cancer were reported from 17 States and the District of Columbia. The rate is per 100,000 population:

Cancer: 1923, 92; 1924, 92; 1925, 94.6; 1926, 97.1; 1927, 98.1; 1928, 100.6; 1929, 100; 1930, 100.7.

Heart Disease: (From reports of 11 States and the District of Columbia) 1923, 181.1; 1924, 185; 1925, 196; 1926, 211; 1927, 210.3; 1928, 228; 1929, 230; 1930, 223.1.

This increase was said to have been consistent with the continued increase in the death rate from cancer during the last several decades.

RECENT DEATH

WOODWORTH—DR. DWIGHT SIDNEY WOODWORTH, of Fitchburg, aged 79, died of heart disease in that city, August 31, 1931.

He was a graduate of the College of Physicians and Surgeons, Columbia University, in 1876, settled in Fitchburg in 1879 and joined the state medical society in that year. He was medical examiner to the third Worcester District from 1923 up to the time of his death. Among his memberships were the American Medical Association, the Massachusetts Medical Society, Thomas Royal Arch Chapter, A. F. & A. M., the Mystic Shrine, Knights of Pythias, and the Square and Compass Club. He was past grand commander of Rollstone Lodge, I. O. O. F., past chief patriarch of King David Encampment and assistant surgeon general of the division, Patriarchs Militant, I. O. O. F., and vice-president and chairman of the board of Masonic trustees.

Dr. Woodworth is survived by a daughter, Miss Laura G. Woodworth, with whom he made his home.

NEWS ITEMS

KNOX COUNTY MEDICAL SOCIETY—On Friday, August 28, the Knox County Medical Society met at Rockland, Maine, being attended by the President, Dr. C. H. Jameson, and the Secretary, Dr. F. F. Brown. After a dinner at the Crescent Beach Inn, a program of talking motion pictures was given by

Dr. P. E. Truesdale of Fall River, Massachusetts. The subjects presented were Surgical Treatment of Diaphragmatic Hernia and Surgical Treatment of Prolapse of the Uterus.

BEQUEST TO TRUESDALE HOSPITAL—A bequest of $25,000 has been made to the Truesdale Hospital, Fall River, Massachusetts, by the late Mary Brayton.

DR. HARVEY CUSHING HONORED—Dr. Harvey Cushing was awarded an honorary degree by the University of Berne, Switzerland, on August 31, at the opening of the International Congress of Neurology. Dr. Bernard Sachs of New York was elected president of the Congress.

NOTICES

CHANGE OF DUTY AND STATIONS OF COMMISSIONED OFFICER OF THE UNITED STATES PUBLIC HEALTH SERVICE IN NEW ENGLAND

P. A. Surgeon (R.) E. D. Middleton, upon completion of present temporary duty, has been directed to proceed from Camp Perry, Ohio, to Boston, Mass., and resume regular duties.

REMOVALS

Dr. J. Walter Schirmer announces the removal of his office to the Van Cortland, 520 Beacon Street, Boston.

Dr. P. J. Carney announces the removal of his office from 626 Southbridge Street, Worcester, to the Medical Arts Building, 36 Pleasant Street, Worcester.

OPENING OF OFFICES

Dr. Bert B. Hershenson announces the opening of offices for the practice of medicine, with special reference to Gynecology and Obstetrics, at 311 Commonwealth Avenue, Boston, and 120 Salem Street, Malden.

UNITED STATES CIVIL SERVICE EXAMINATION

The United States Civil Service Commission announces the following-named open competitive examination:

Assistant Statistician (Public Health)

Applications for the position of assistant statistician must be on file with the U. S. Civil Service Commission at Washington, D. C., not later than October 6, 1931.

The examination is to fill vacancies in the Public Health Service, for duty in Washington, D. C., or in the field.

The entrance salary is $2,600 a year.

Competitors will not be required to report for examination at any place, but will be rated on their education and experience, and on their thesis or published writings.

Applicants must have been graduated from a college or university of recognized standing after the completion of at least 118 credit hours of college work; and, in addition, must have had at least two years' suitable experience of postgraduate study in the field of vital, public health, or epidemiological statistics.

Full information may be obtained from the Secretary of the United States Civil Service Board of Examiners at the post office or customhouse in any city or from the United States Civil Service Commission, Washington, D. C.

RADIO HEALTH MESSAGES

Sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

Courtesy WBZA. Thursdays at 5:17 P. M.

September
10 Bright's Disease
17 What to do About Cancer
24 Nerves

October
1 Gall Stones
8 What a Health Examination Means
15 Sunlight and Ultra-violet Rays
22 Hospitals—Then and Now
29 What the Public Should Know of Diabetes

November
5 High Blood Pressure
12 The Care of Pulmonary Tuberculosis
19 Accidents in the Home
26 Fatigue as a Symptom of Disease

December
3 Overweight—Cause and Prevention
10 Can We Prolong Life?
17 Pasteurized or Raw Milk
24 Public Health in the Coming Year
31 Mental Health

State House Broadcast

Sponsored by the Massachusetts Department of Public Health.

Courtesy WEEI. Fridays at 12:30 P. M.

The various activities of the Department are discussed by the Directors of its nine Divisions.

Radio Health Forum

Directed by the Massachusetts Department of Public Health.

Courtesy WEEI. Fridays at 4:50 P. M.

Queries from the public are answered under the sponsorship of the Department.

Questions on Health and Prevention of Disease may be sent to: Radio Health Forum, State Department of Public Health, State House, Boston.

REPORT AND NOTICES OF MEETINGS

WACHUSETT MEDICAL IMPROVEMENT SOCIETY

The last meeting of the Wachusett Medical Improvement Society was held September 2, 1931, at the Holden District Hospital.

Dr. Lester Felton of Worcester read a paper entitled "Prostatectomies." General discussion followed.

Buffet luncheon was served at 7:30 P. M.

WILLIAM T. KNOWLTON,
Secretary and Treasurer.

SPECIAL COURSE IN ANESTHESIA

A Special Course in Regional and Spinal Anesthesia will be given, as a substitute for the usual October course, by Dr. Gaston Labat, from 2:00 to 5:00 P. M., during the week (October 12-16) of the Clinical Congress of the American College of Surgeons, at University and Bellevue Hospital Medical College, 338 East 26th Street, New York.

Monday, October 12—(1) General Principles; (2) Trigeminal Block.

Tuesday, October 13—(1) Cervical Plexus Block; (2) Brachial Plexus Block.

Wednesday, October 14 — Paravertebral (dorsal and lumbar) Block.

Thursday, October 15—Sacral Block.

Friday, October 16—Subarachnoid Block.

Fee, $100.00. Full particulars will be mailed upon request.

NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

The regular clinicopathological conference of the New England Hospital for Women and Children, Dimock Street, Roxbury, will be held at the hospital on Thursday, September 17, at 8 P. M. A group of case reports from the pediatric department will be presented.

ALICE H. BIGELOW, M.D., *Secretary.*

MIDDLESEX SOUTH DISTRICT MEDICAL GOLF ASSOCIATION

Fall tournament at Belmont Spring Country Club, Wednesday, September 16.

PROGRAM INTERNATIONAL ASSEMBLY OF THE INTER-STATE POSTGRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

MILWAUKEE, WISCONSIN, OCTOBER 19, 20, 21, 22, 23, 1931

MONDAY, OCTOBER 19

7:30 A. M.

Diagnostic Clinic (Medical).
Dr. Elsworth S. Smith, Emeritus Professor of Clinical Medicine, Washington University School of Medicine, St. Louis, Mo.

Diagnostic Clinic (Obstetrical).
Dr. Irvin Abell, Clinical Professor of Surgery, University of Louisville School of Medicine, Louisville, Ky.

Diagnostic Clinic (Medical).
Dr. Harlow Brooks, Professor of Clinical Medicine, University and Bellevue Hospital Medical College, New York, N. Y.

Diagnostic Clinic (Surgical).
Dr. Frank H. Lahey, Director, Lahey Clinic, Boston, Mass.

Intermission for Review of Exhibits

Diagnostic Clinic (Pediatric).
Dr. Alan G. Brown, Professor of Pediatrics, University of Toronto Faculty of Medicine, Toronto, Canada.

Diagnostic Clinic (Medical).
Dr. Henry A. Christian, Hersey Professor of the Theory and Practice of Physic, Harvard University Medical School, Boston, Mass.

Address: "Chronic Arthritis as an Economic Human Problem."
Dr. Robert B. Osgood, John B. & Buckminster Brown Emeritus Professor of Orthopedic Surgery, Harvard University Medical School, Boston, Mass.

Noon Intermission

1:00 P. M.

The Thyroid Gland

Address: "The Use of Iodin in Graves' Disease."
Dr. Clarence G. Toland, Associate Professor of Clinical Surgery, College of Medical Evangelists, Loma Linda, Los Angeles, Calif.

Address: "The Use of Iodin in Recurrent Exophthalmic Goiter."
Dr. S. F. Haines, Instructor in Medicine, University of Minnesota, Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Address: "The Safeguards in the Technic of Operations on the Thyroid Gland."
Dr. Robert S. Dinsmore, Cleveland Clinic, Cleveland, Ohio.

Address: "Thyroiditis."
Dr. Frank H. Lahey, Director, Lahey Clinic, Boston, Mass.

Address: "Cardiac Irregularities Associated with Diseases of the Thyroid Gland."
Dr. Elsworth S. Smith, Emeritus Professor of Clinical Medicine, Washington University School of Medicine, St. Louis, Mo.

Intermission for Review of Exhibits

Obstetrics and Gynecology

Address: "Retroversion of the Uterus, and Complete Prolapse of the Uterus."
Dr. Irvin Abell, Clinical Professor of Surgery, University of Louisville School of Medicine, Louisville, Ky.

Address: "Conservative Treatment of Eclampsia."
Dr. Otto H. Schwarz, Professor of Obstetrics and Gynecology, Washington University School of Medicine, St. Louis, Mo.

Motion Picture: "Suspension of the Uterus for Retro-Displacement."
Dr. Harold O. Jones, Associate Professor of Obstetrics and Gynecology, Northwestern University Medical School, Chicago, Illinois.

The Circulatory System

Address: "Mechanism and Transmission of Heart Murmurs with a Special Consideration of 'The Unimportant Murmur.'"
Dr. S. Marx White, Professor of Medicine, University of Minnesota Medical School, and University of Minnesota, Graduate School of Medicine, Minneapolis, Minn.

Address: "Syphilitic Aortitis."
Dr. Wm. S. Middleton, Associate Professor of Medicine, University of Wisconsin Medical School, Madison, Wisconsin.

Address:
Dr. Barney Brooks, Professor of Surgery, Vanderbilt University School of Medicine, Nashville, Tenn.

Dinner Intermission

7:00 P. M.

The Circulatory System (Continued)

Address: "Syndrome of Ayerza."
Dr. Wm. Sharp McCann, Professor of Medicine, University of Rochester, School of Medicine, Rochester, N. Y.

Address: "Circulatory Failure in Acute Infectious Diseases."
Dr. Charles A. Elliott, Professor of Medicine, Northwestern University Medical School, Chicago, Ill.

Address: "Heart Diseases in Children and their Sequelae."
Dr. Alan G. Brown, Professor of Pediatrics, University of Toronto Faculty of Medicine, Toronto, Canada.

Address: "Prognosis of Hypertension."
Dr. Louis Hamman, Associate Professor of Clinical Medicine, Johns Hopkins University School of Medicine, Baltimore, Md.

Address: "Coronary Thrombosis."
Dr. Harlow Brooks, Professor of Clinical Medicine, University and Bellevue Hospital Medical College, New York, N. Y.

Address: "The Diagnosis and Treatment of Adhesive Pericarditis."
Dr. C. Sidney Burwell, Professor of Medicine, Vanderbilt University School of Medicine, Nashville, Tenn.

Address: "Aortic Lesions in Relation to Cardiac Physical Signs and Cardiac Function."
Dr. Henry A. Christian, Hersey Professor of the Theory and Practice of Physic, Harvard University Medical School, Boston, Mass.

TUESDAY, OCTOBER 20

7:30 A. M.

Diagnostic Clinic (Surgical).
Dr. John F. Erdmann, Professor of Surgery, Columbia University, and Director of Surgery, Post Graduate Hospital of Columbia University, New York, N. Y.

Diagnostic Clinic: "Toxemias of Pregnancy" and "Antenatal Hemorrhage."
Dr. P. Brooke Bland, Professor of Obstetrics, Jefferson Medical College of Philadelphia, Philadelphia, Pa.

Diagnostic Clinic (Surgical).
Dr. John M. T. Finney, Professor of Clinical Surgery, Johns Hopkins University School of Medicine, Baltimore, Md.

Diagnostic Clinic (Medical).
Dr. Campbell P. Howard, Professor of Medicine, McGill University Faculty of Medicine, and Physician to the Montreal General Hospital, Montreal, Canada.

Intermission for Review of Exhibits

Diagnostic Clinic (Surgical).
Dr. F. N. G. Starr, Professor of Clinical Surgery, University of Toronto Faculty of Medicine, Toronto, Canada.

Diagnostic Clinic (Oto-Laryngological).
Dr. Samuel J. Crowe, Clinical Professor of Laryngology and Otology, Johns Hopkins University School of Medicine, Baltimore, Md.

Address: "Allergic Diseases."
Dr. Warren T. Vaughan, Professional Bldg., Richmond, Va.

Noon Intermission

1:00 P. M.

The Gastro-Intestinal Tract

Address: "Peptic Ulcer — A Review of Present Knowledge of Etiology, and Best Methods of Treatment."
Dr. John M. T. Finney, Professor of Clinical Surgery, Johns Hopkins University School of Medicine, Baltimore, Md.

Address: "Surgical Aspects of Carcinoma of the Rectum."
Dr. John F. Erdmann, Professor of Surgery, Columbia University, and Director of Surgery, Post Graduate Hospital of Columbia University, New York, N. Y.

Address: "Cancer of the Stomach."
Dr. F. N. G. Starr, Professor of Clinical Surgery, University of Toronto Faculty of Medicine, Toronto, Canada.

Address: "The Present Status of the Treatment of Hirschsprung's Disease."

Dr. Fred W. Rankin, Associate Professor of Surgery, University of Minnesota, Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Address: "Does Peptic Ulcer Cause Permanent Disability?"

Dr. Wm. Gerry Morgan, Professor of Gastro-Enterology, Georgetown University School of Medicine, Washington, D. C.

Intermission for Review of Exhibits

Oto-Laryngology

Address: "Plastic Surgery of the Nose, Lips and Cheeks."

Dr. Gordon B. New, Professor of Laryngology, University of Minnesota, Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Address: "Laryngitis."

Dr. Fielding O. Lewis, Professor of Laryngology, Jefferson Medical College of Philadelphia, Philadelphia, Pa.

Address: "Diseases of the Ear that Give Rise to Deafness."

Dr. Samuel J. Crowe, Clinical Professor of Laryngology and Otology, Johns Hopkins University School of Medicine, Baltimore, Md.

Address: "Diagnosis and Treatment of Carcinoma of the Larynx."

Dr. William V. Mullin, Head of the Department of Oto-Laryngology, Cleveland Clinic, Cleveland, Ohio.

Address: "Congenital Syphilis."

Dr. Isaac A. Abt, Professor of Pediatrics, Northwestern University Medical School, Chicago, Ill.

Dinner Intermission

7:00 P. M.

Malignant Diseases

Address: "Malignant Diseases in Childhood."

Dr. H. F. Helmholz, Professor of Pediatrics, University of Minnesota, Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Address: "Incidence, Diagnosis and Treatment of the Primary Malignant Tumors of Long Bones."

Dr. Dean D. Lewis, Professor of Surgery, Johns Hopkins University School of Medicine, Baltimore, Md.

Address: "Radiation Therapy in Intra-Oral Cancer with its Complications."

Dr. James M. Martin, Professor of Radiology, Baylor University College of Medicine, Dallas, Tex.

Address: "Infantile Paralysis."

Dr. Wm. McKim Marriott, Dean and Professor of Pediatrics, Washington University School of Medicine, and Physician-in-Chief, St. Louis Children's Hospital, St. Louis. Mo.

Address: "Etiology and Treatment of Low Back Pain from the Mechanistic (Orthopedic) Point of View."

Dr. Arthur Steindler, Professor of Orthopedic Surgery, State University of Iowa College of Medicine, Iowa City, Iowa.

Address: "Recent Advances in the Treatment of Nephritis."

Dr. James S. McLester, Professor of Medicine, University of Alabama School of Medicine, Birmingham, Alabama.

WEDNESDAY, OCTOBER 21

7:30 A. M.

Diagnostic Clinic (Surgical).

Dr. Dean D. Lewis, Professor of Surgery, Johns Hopkins University School of Medicine, Baltimore, Md.

Diagnostic Clinic (Medical).

Dr. Leonard G. Rowntree, Professor of Medicine, University of Minnesota, Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Diagnostic Clinic (Urological).

Dr. Herman L. Kretschmer, Clinical Professor of Surgery (G.U.), Rush Medical College, Chicago, Ill.

Diagnostic Clinic (Surgical).

Dr. Charles H. Frazier, John Rhea Barton Professor of Surgery, University of Pennsylvania School of Medicine, Philadelphia, Pa.

Intermission for Review of Exhibits

Diagnostic Clinic (Surgical).

Dr. William E. Lower, Cleveland Clinic; Former Associate Professor of Genito-Urinary Surgery, Western Reserve University School of Medicine, Cleveland, Ohio.

Diagnostic Clinic (Surgical).

Dr. Edmond M. Eberts, Professor of Surgery, McGill University Faculty of Medicine, Montreal, Canada.

Address: "The Influence of Pain and Mortality in Modern Medical Practice."

Dr. Charles H. Mayo, Associate Chief of Staff, Mayo Clinic; Professor of Surgery, University of Minnesota Medical School, and University of Minnesota, Graduate School of Medicine, Rochester, Minn.

Noon Intermission

1:00 P. M.

Diagnostic Clinic (Surgical).

Dr. Fred W. Rankin, Associate Professor of Surgery, University of Minnesota, Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Urology

Address: "Conservative Plastic Procedure in Prostatic Hypertrophy."

Dr. Joseph F. McCarthy, Professor of Urology, New York Post Graduate Medical School, New York, N. Y.

Address: "Further Research Studies of the Factors Which Are Conducive to the Production of Prostatic Hypertrophy."

Dr. William E. Lower, Cleveland Clinic; Former Associate Professor of Genito-Urinary Surgery, Western Reserve University School of Medicine, Cleveland, Ohio.

Address: "Treatment of Carcinoma of the Bladder."

Dr. Herman L. Kretschmer, Clinical Professor of Surgery (G.U.), Rush Medical College, Chicago, Ill.

Address: "The Value and Limitations of Intravenous Pyelography in the Diagnosis of Renal and Ureteral Diseases."

Dr. Bernard H. Nichols, Head of the Department of Radiology, Cleveland Clinic, Cleveland, Ohio.

Address: "Diagnosis and Treatment of Tumors of the Testicle."

Dr. Charles C. Higgins, Cleveland Clinic, Cleveland, Ohio.

Intermission for Review of Exhibits

The Central Nervous System

Address: "Experience Gained in One Hundred Operations under Local Anesthetic for the Permanent Cure of Trigeminal Neuralgia Major."

Dr. Wm. T. Coughlin, Professor of Surgery, St. Louis University School of Medicine, St. Louis, Mo.

Address: "Encephalography and Ventriculography—Methods and Interpretation."

Dr. Charles H. Frazier, John Rhea Barton Professor of Surgery, University of Pennsylvania School of Medicine, Philadelphia, Pa.

Address: "Choice of Anesthetic Methods in Different Types of Patients and Conditions."

Dr. John S. Lundy, Associate Professor of Anesthesia, University of Minnesota, Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Dinner Intermission

7:00 P. M.

Address: "Symptomatology, Prognosis and Treatment of Minor Neuroses and Psychoses."

Dr. Louis J. Karnosh, Assistant Clinical Professor of Nervous Diseases, Western Reserve University School of Medicine, Cleveland, Ohio.

Address: "Pulsating Exophthalmos with Special Reference to Surgical Treatment."

The Joseph Schneider Foundation Presentation.

Dr. John M. Wheeler, Professor of Ophthalmology, Columbia University College of Physicians and Surgeons, New York, N. Y.

Address: "Suggestions from Medical Psychology in the Field of General Medicine."

Dr. Wm. A. White, Professor of Mental and Nervous Diseases, Georgetown University School of Medicine, Washington, D. C.

Address: "Water in Relation to Health and Disease."

Dr. Leonard G. Rowntree, Professor of Medicine, University of Minnesota, Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Address: "Water and Chemical Balance in Surgery."

Dr. Thomas G. Orr, Professor of Surgery, University of Kansas School of Medicine, Kansas City, Kansas.

THURSDAY, OCTOBER 22

8:00 A. M.

Diagnostic Clinic (Surgical).

Dr. Waltman Walters, Associate Professor of Surgery, University of Minnesota, Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Diagnostic Clinic (Medical).

Dr. Russell L. Cecil, Assistant Professor of Clinical Medicine, Cornell University Medical College, New York, N. Y.

Diagnostic Clinic (Pediatric).

Dr. Wm. McKim Marriott, Dean and Professor of Pediatrics, Washington University School of Medicine, and Physician-in-Chief, St. Louis Children's Hospital, St. Louis, Mo.

Diagnostic Clinic (Surgical).

Dr. Arthur Dean Bevan, Clinical Professor of Surgery and Head of the Surgical Department, Rush Medical College, Chicago, Ill.

Intermission for Review of Exhibits

Diagnostic Clinic (Medical).

Dr. Russell L. Haden, Chief of the Medical Staff, Cleveland Clinic, Cleveland, Ohio.

Diagnostic Clinic: "Differentiation of Benign and Malignant Tumors of the Breast."

Dr. Burton J. Lee, Professor of Clinical Surgery, Cornell University Medical College, and Clinical Director of Memorial Hospital, New York, N. Y.

Diagnostic Clinic (Medical).

Dr. James H. Means, Jackson Professor of Clinical Medicine, Harvard University Medical School, and Chief of the Medical Services, Massachusetts General Hospital, Boston, Mass.

Noon Intermission

1:00 P. M.

The Respiratory System

Address: "Roentgenological Diagnosis of Early Tuberculosis."

Dr. B. R. Kirklin, Mayo Clinic, Rochester, Minn.

Address: "Injuries of the Lungs and Pleura."

Dr. Frank K. Boland, Professor of Clinical Surgery, Emory University School of Medicine, Atlanta, Ga.

Address: "Diagnosis and Treatment of Mediastinal Tumors."
Dr. Stuart W. Harrington, Associate Professor of Surgery, University of Minnesota, Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Address: "Bronchial Obstruction, Partial or Complete, as Shown by the Roentgen Ray Examination."
Dr. Willis F. Manges, Professor of Roentgenology, Jefferson Medical College of Philadelphia, Philadelphia, Pa.

Address: "Abscess of the Lung."
Dr. Carl A. Hedblom, Professor of Surgery, University of Illinois College of Medicine, Chicago, Ill.

Address: "Recent Advances in Diagnosis and Treatment of Pneumonia."
Dr. Russell L. Cecil, Assistant Professor of Clinical Medicine, Cornell University Medical College, New York, N. Y.

Address: "Surgical Treatment of Pulmonary Tuberculosis."
Dr. Alton Ochsner, Professor of Surgery, Tulane University of Louisiana School of Medicine, New Orleans, La.

Intermission for Review of Exhibits

Fractures

Address: "The Treatment of Fractures."
Dr. Melvin S. Henderson, Professor of Orthopedic Surgery, University of Minnesota, Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Address: "Operative Arrestment of Longitudinal Growth of Bones; Indications for and Results of."
Dr. D. B. Phemister, Professor of Surgery, University of Chicago Medical School, Chicago, Ill.

Address: "The Treatment of Ununited Fractures."
Dr. Edwin W. Ryerson, Professor of Orthopedic Surgery, Northwestern University Medical School, Chicago, Ill.

Address: "Purpura and Pathological Hemorrhage."
Dr. Russell L. Haden, Chief of the Medical Staff, Cleveland Clinic, Cleveland, Ohio.

Dinner Intermission

7:00 P. M.

The Breast

Address: "The Choice and Technic of Surgical Methods in the Treatment of Carcinoma of the Breast."
Dr. Arthur Dean Bevan, Clinical Professor of Surgery and Head of the Surgical Department, Rush Medical College, Chicago, Ill.

Address: "Paget's Disease of the Breast."
Dr. Edmond M. Eberts, Professor of Surgery, McGill University Faculty of Medicine, Montreal, Canada.

Address: "Therapeutic Problems of Syphilis."
Dr. Paul A. O'Leary, Professor of Dermatology, University of Minnesota, Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Address: "Significance of Hyper- and Hypo- Metabolism."
Dr. James H. Means, Jackson Professor of Clinical Medicine, Harvard University Medical School, and Chief of the Medical Services, Massachusetts General Hospital, Boston, Mass.

Address: "Bright's Disease."
Dr. Hilding Berglund, Professor of Medicine, University of Minnesota Medical School, and University of Minnesota, Graduate School of Medicine, Minneapolis, Minn.

Address: "Some Aspects of Asthma."
Dr. Robert D. Rudolf, Professor of Therapeutics, University of Toronto Faculty of Medicine, Toronto, Canada.

FRIDAY, OCTOBER 23

7:30 A. M.

Diagnostic Clinic (Surgical).
Dr. E. Starr Judd, Professor of Surgery, University of Minnesota, Graduate School of Medicine, Mayo Clinic, Rochester, Minn. President, American Medical Association.

Diagnostic Clinic (Medical).
Dr. John H. Musser, Professor of Medicine, Tulane University of Louisiana School of Medicine, New Orleans, La.

Diagnostic Clinic (Surgical).
Dr. John B. Deaver, Emeritus Professor of Surgery, University of Pennsylvania School of Medicine, and Surgeon-Chief to the Lankenau Hospital, Philadelphia, Pa.

Diagnostic Clinic (Medical).
Dr. Cyrus C. Sturgis, Professor of Internal Medicine, University of Michigan Medical School, Ann Arbor, Michigan.

Intermission for Review of Exhibits

Diagnostic Clinic (Surgical).
Dr. George W. Crile, Cleveland Clinic; Professor Emeritus of Surgery, Western Reserve University School of Medicine, Cleveland, Ohio.

Diagnostic Clinic (Medical).
Dr. Elliott P. Joslin, Clinical Professor of Medicine, Harvard University Medical School, Boston, Mass.

Address: "The Importance of Preserving or Restoring Function in Performing Radical Operations on the Large Intestine and Rectum."

Dr. William J. Mayo, Chief of Staff, Mayo Clinic, Rochester, Minn.

and

Dr. C. F. Dixon, Division of Surgery, Mayo Clinic, Rochester, Minn.

Noon Intermission

1:00 P. M.

Address:

Surgeon-General Hugh S. Cumming, United States Public Health Service, Washington, D. C.

The Gall-Bladder and Liver

Address: "Different Forms of Jaundice and their Significance."

Dr. James E. Paullin, Jr., Professor of Clinical Medicine, Emory University School of Medicine, Atlanta, Ga.

Address: "Malignant Lesions of the Gall-Bladder."

Dr. E. Starr Judd, Professor of Surgery, University of Minnesota, Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Address: "The Medical Treatment of Gall-Stones and Cholecystitis."

Dr. John H. Musser, Professor of Medicine, Tulane University of Louisiana School of Medicine, New Orleans, La.

Address: "Surgical Aspects of Obstructive Jaundice."

Dr. Waltman Walters, Associate Professor of Surgery, University of Minnesota, Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Address: "Acute Yellow Atrophy of the Liver—Incidence, Pathogenesis, End-Stages."

Dr. M. A. Blankenhorn, Professor of Clinical Medicine, Western Reserve University School of Medicine, Cleveland, Ohio.

Address: "The Functionless Gall-Bladder."

Dr. John B. Deaver, Emeritus Professor of Surgery, University of Pennsylvania School of Medicine, and Surgeon-Chief to the Lankenau Hospital, Philadelphia, Pa.

Intermission for Review of Exhibits

Address: "Present Aspects of Treatment of Pernicious Anemia."

Dr. Cyrus C. Sturgis, Professor of Internal Medicine, University of Michigan Medical School, Ann Arbor, Michigan.

Address: "Indications for the Clinical Results in Denervation of the Adrenal Gland."

Dr. George W. Crile, Cleveland Clinic; Professor Emeritus of Surgery, Western Reserve University School of Medicine, Cleveland, Ohio.

and

Dr. E. P. McCullagh, Cleveland Clinic, Cleveland, Ohio.

Address: "Complications and Sequelae of Diabetes."

Dr. Elliott P. Joslin, Clinical Professor of Medicine, Harvard University Medical School, Boston, Mass.

FOREIGN GUESTS

The following is a list of distinguished foreign guests who have tentatively accepted to take part on the program some time during the Assembly:

Mr. A. A. McConnell, F.R.C.S.I., Chief Surgeon, Richmond Hospital, Dublin, Ireland.

Mr. A. Lawrence Abel, F.R.C.S., Surgeon Cancer Hospital, London, England.

Sir Thomas J. Horder, Bt., London, England.

Dr. Thierry de Martel, Chief Surgeon, American Hospital, Paris, France.

SOCIETY MEETINGS CONGRESSES AND CONFERENCES

September 11-12—New England Surgical Society. See page 366, issue of August 13.

September 14-17—The American Public Health Association. See page 415, issue of August 20.

September 17—New England Hospital for Women and Children. See page 555.

September 22, 23, 24—The Seventh Clinical Congress of the Connecticut State Medical Society. See notices on page 365, issue of August 13, and page 513, issue of September 3.

October 5, 6, 7, 8—American Congress of Physical Therapy. See notice on page 272, issue of July 30.

October 8-9—Vermont State Medical Society. See page 493, issue of September 3.

October 12-16—Announcement of the Clinical Congress of the American College of Surgeons. See page 1175, issue of May 28.

October 12-16—Special Course in Anesthesia. See page 555.

October 19-23—International Assembly of the Interstate Postgraduate Medical Association of North America. See page 1125, issue of May 21, and page 555 of this issue.

October 19-30—Graduate Fortnight of the New York Academy of Medicine. See page 1230, issue of June 4, and page 465, issue of August 27.

April 4-8, 1932—The American College of Physicians. See notice on page 1232, issue of June 4.

Autumn 1931—Spring 1932—International Medical Postgraduate Courses in Berlin. See page 468, issue of August 27.

DISTRICT MEDICAL SOCIETIES

Bristol North District Medical Society

The fall meeting will be held at Mansfield, September 17. Dinner at the Mansfield Tavern, Mansfield, at 1 P. M. Speaker: Dr. Cadis Phipps of Boston. Subject: "Management of Ambulatory Cases of Heart Disease."

C. B. KINGSBURY, M.D., Secretary.

Franklin District Medical Society

Meetings will be held on the second Tuesday of November, January, March and May at the Weldon, Greenfield, at 11 A. M.

CHARLES MOLINE, Secretary.

Middlesex South District Medical Society

September 16—Golf Association. See page 468, issue of August 27.

Worcester District Medical Society

Wednesday evening, October 14, 1931—Worcester Chamber of Commerce Rooms, Franklin Street, Worcester, Mass. 7:45—Program: Recent Advances in the Etiology and Treatment of Cancer, by Dr. Clarence C. Little, Bar Harbor, Me.

Wednesday evening, November 11, 1931—Worcester Chamber of Commerce Rooms, Franklin Street, Worcester, Mass. 7:45—Program: Bone Lesions of Congenital Syphilis, by Dr. Stafford McLean, Clinical Professor, Diseases of Children, Columbia University College of Physicians and Surgeons, New York City.

Wednesday evening, December 9, 1931—Worcester Chamber of Commerce Rooms, Franklin Street, Worces-